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**THE  
ARMOURER'S  
HANDBOOK**

**Part III  
LIGHT MACHINE GUNS**

**LABORE**

**GALE & POLDEN LIMITED**



Publisher's Announcement

**THE ARMOURER'S HANDBOOK**

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THE  
**ARMOURER'S  
HANDBOOK**

Part III  
**LIGHT MACHINE GUNS**

BY  
LABORE

ALDERSHOT  
GALE AND POLDEN LIMITED

Price Two Shillings net  
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## FOREWORD

THIS little book deals entirely with the light machine guns in use to-day with the Services.

It is written to assist armourers and inspecting officers. Some details on various stoppages and general comparisons are given to enable an assessment to be made of the general capabilities of the gun in question.

This book follows in logical sequence after the other two, which dealt with "Rifles" and "Machine Carbines and Pistols."

LABORE.



# COMPARISONS OF BREN GUN AND VICKERS BERTHIER GUN

1. **The Breech Block.**—In the Vickers Berthier gun the breech block is carried forward by a step bearing against the rear of the breech block. It rides over a rib in the body, which raises the rear end clear of the step. The locking lugs then riding in recesses cut inside the breech block force the rear end up, tilting the breech block and locking it into the locking shoulder.

In the Bren gun the breech block is carried forward by a ramp on the sear of the piston, and it is prevented from rising by the narrow space in the body.

*Advantage.*—In the Vickers Berthier gun there is no friction on the movement of the breech block, whereas in the Bren gun there is.

*Disadvantage.*—The mechanical safety on the Vickers Berthier gun is less than the Bren gun,  $\frac{1}{2}$  in. to  $\frac{5}{8}$  in.

2. **The Feed** is spring-operated on the Vickers Berthier gun and solid on the Bren gun. On the return, the solid feed on the Bren gun tends to force up the rounds into the magazine and may displace them.

*Advantage* in the Vickers Berthier gun is that the spring feed will not force these rounds up; therefore there is definitely less likelihood of rounds being displaced.

3. **The Holding Open Device.**—In the Vickers Berthier gun there is a pronged fork that is pushed down by two projections—one on either side of the magazine to engage in recesses cut in the breech block, when empty.

In the Bren gun this is done by the magazine platform dropping

*Disadvantage* in the Vickers Berthier gun is the number of parts required to carry out this operation.

4. **The Gases** in the Vickers Berthier gun pass into the gas chamber, which is below the head of the piston; they are regulated there. Should more gas be wanted, a smaller hole is required—the reverse to the Bren gun.

*Advantage* of Vickers Berthier gun over Bren gun is that the gases striking the cup-shaped portion of the piston are *cool* gases. In the Bren they go on direct and are therefore hot.

5. **Change of Barrel.**—In the Vickers Berthier gun the gun has to be cocked before the barrel can be changed, as the piston is forward into the nozzle of the barrel. In the Bren gun this is not necessary.

*Disadvantage* to the Vickers Berthier gun.

6. **Dust Cover** in the Bren gun will remain closed on cocking the gun; in the Vickers Berthier gun will open.

*Advantage* for Vickers Berthier gun, as any dummy accidentally left in will be ejected.

7. **Sights.**—Radial sight on the Bren gun and tangent sight on the Vickers Berthier gun.

*Disadvantage* to Vickers Berthier gun, as tangent sight more likely to be damaged.



# THE BREN LIGHT MACHINE GUN .303-INCH MARK I

## EXAMINATION OF THE BREN LIGHT MACHINE GUN

1. Pull back the cocking handle and ensure that the breech is clear.
2. Check the number which is on top of the body. This is the master number and all other numbers must agree with it. These numbers are to be found on the barrel, barrel nut, butt slide and spare barrel (which has the letter "S" after the number). The breech block has a different number.

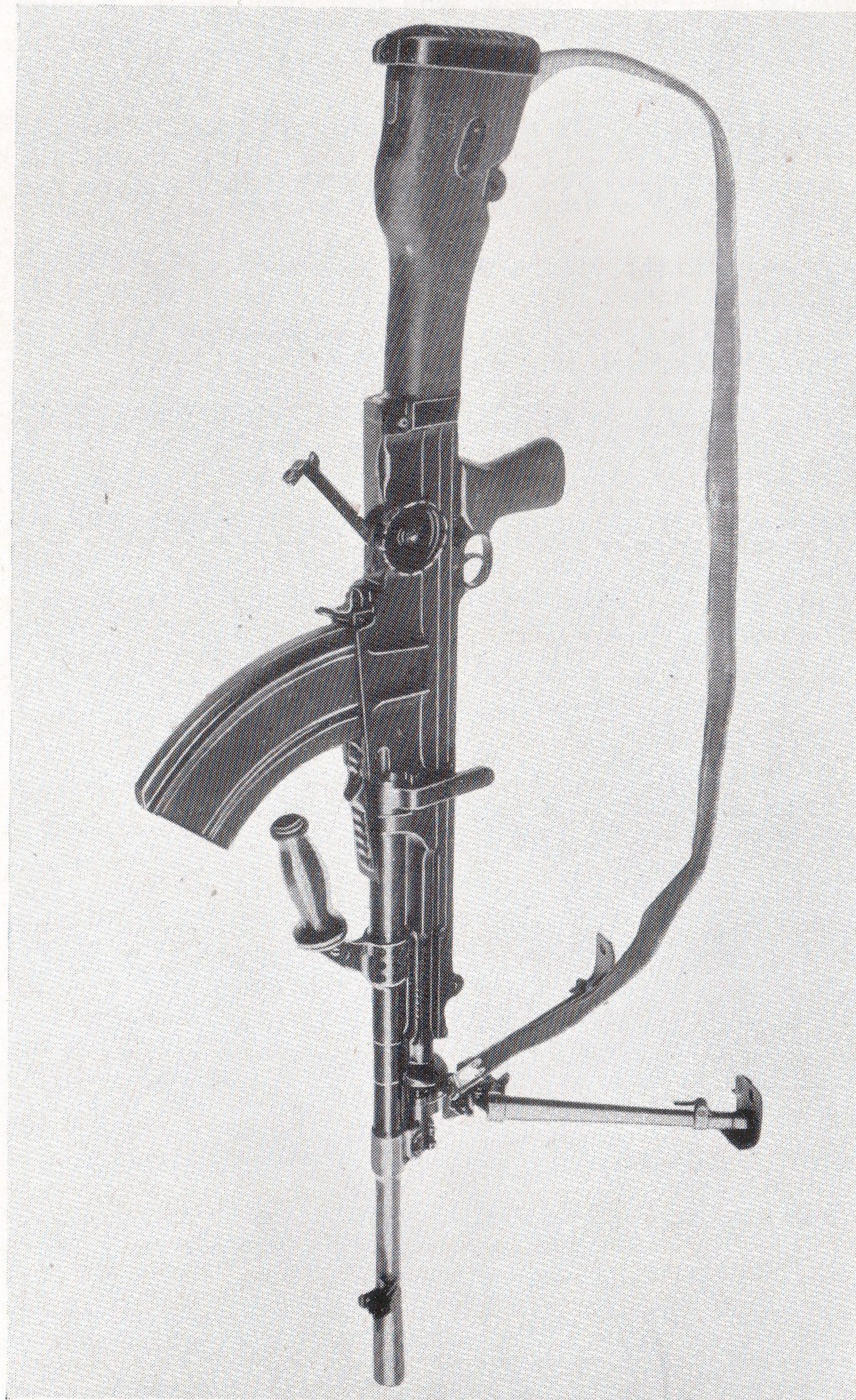
### Barrel Group

3. Check the foresight protector for damage or distortion.
4. See that the foresight protector screw is tight.
5. Ensure that the foresight blade is not assembled back to front or damaged.
6. Check that the gas regulator retainer is in position.
7. See that the gas block fixing pin is secure.
8. Check that the carrying handle screw is tight.
9. Ensure that the detent pin is secure.
10. See that the carrying handle stem nut is tight.
11. Make certain that the woodwork on the carrying handle is not split.

### Body Group

12. See that the barrel nut stop is in position.
13. Ensure that the catch pin is in position.
14. Test to see that the catch spring functions correctly.
15. See that the magazine cover slides correctly and is not distorted.
16. Press down the plunger of the barrel locking nut and make sure that the spring functions correctly.
17. Ensure that the magazine catch retainer is in position.
18. See that the magazine catch spring functions correctly.
19. See that the ejector is not broken.
20. Rotate the drum of the backsight and ensure that it functions.
21. Examine the backsight aperture.
22. See that the backsight split pin and nut are in position.
23. Make sure that the body locking pin is in position.
24. See that the cocking handle pin is present, and that the pin and plunger work correctly.
25. See that the cocking handle slide is not distorted or burred.

THE BREN LIGHT MACHINE GUN .303-INCH MARK I





### Bipod Group

26. See that the sleeve nut pin is tight and centre punched.
27. Look at the legs to see that they are not distorted.
28. See that the telescopic catch spring, catch and the axis pins are secure.
29. Ensure that the telescopic legs are not distorted.
30. Make sure that the shoes are not bent or damaged.
31. Look at the bracket screw and see that it is tight.
32. See that the legs stop is not distorted.
33. Make sure that the spring functions correctly.
34. Look at the sling loop.

### Trigger Group

35. Make sure that the change lever plunger spring functions correctly.
36. Look at the trigger tail and guard for distortion.

### Butt Group

37. See that the cocking handle cover is not distorted.
38. Check the sling bracket screws for tightness.
39. Look at the swivel loop for distortion.
40. Ensure that the swivel bracket plate is in position.
41. Test the mounting bracket screws for tightness.
42. Look at the mounting bracket for distortion.
43. Test the mounting pin for fit, and see that the lever is not distorted.
44. Look at the butt plate for distortion.

### Slide Group

45. See that the ejection opening cover is not distorted.
46. Make sure that the catch spring functions correctly.
47. Look at the mounting bracket for distortion.
48. Look at the mounting pin for fit and distortion of lever.

### The Magazine

49. See that the magazine case is not distorted.
50. Make sure the end plate is in position.
51. Check the platform for burrs.
52. See that the auxiliary spring is in position.
53. Check the spring for correct functioning.

## TO STRIP

### Barrel Group

1. Raise the barrel locking nut.
2. Push forward and remove the barrel.
3. Take off the gas regulator by rotating the regulator until the key comes in line with the keyway in the gas block. Press down the retainer and press out the regulator.
4. The retainer can be removed by drawing out the fixing pin.
5. Unscrew the foresight protector screw.
6. Remove the foresight protector.
7. Drive out the foresight.
8. Unscrew the stem nut.
9. Pull off the grip.
10. Unscrew the carrying handle screw.
11. Remove the stem.
12. Drive out the plunger pin.
13. Remove the plunger and spring.
14. Remove the sleeve.

The foresight protector must be removed before the foresight can be changed.

Carrying Handle Group.

### Body Group

15. Pull out the body locking pin to the right as far as possible.
16. Withdraw the butt slide by pulling the butt to the rear.
17. Pull out the piston and breech block. To do this, insert the hand underneath the body.
18. Disconnect the bipod from the gas cylinder.
19. Remove the barrel locking nut by pressing down with the point of a bullet on the plunger.
20. Drive off the stop on the barrel nut. (This is only removed when damaged.)
21. Drive out the catch pin.
22. Remove the catch and spring.
23. Drive out the gas cylinder pin.
24. Unscrew the cylinder from the body.
25. Push out the magazine catch pin as far as it will go.
26. Remove the magazine catch and ejector.
27. Separate the ejector from the catch by pressing together and lifting.
28. Remove the magazine catch spring.
29. Remove the magazine opening cover by sliding to the rear.
30. Using two punches, press in the locking nut, then, continuing to press, push up the plunger *from the underneath*.
31. Remove the plunger, pawl and spring.

Barrel Locking Nut Group.

This is done in the factory, but must *not* be attempted by any armoured.



32. In order to remove the magazine catch pin, pull it just clear of the body and with a pair of pliers just rotate it and withdraw.
33. Remove the plunger and spring.
34. To remove the body locking pin, the procedure is the same as in Nos. 32 and 33.
35. Drive out the cocking handle pin.
36. Remove the cocking handle, plunger and spring.
37. Pull out the slide.
38. Remove the backsight cam nut split pin.
39. Unscrew the cam nut.
40. Pull off the radial backsight drum.
41. Unscrew the backsight bed screw.
42. Remove the backsight from the body.
43. Remove the detent and spring.
44. Remove the backsight cam.
45. Remove the plunger and spring.
46. Pull out the aperture sight.

Back Sight  
Group.

#### Bipod Group

47. Unscrew the sleeve nut pin.
48. Remove the pin by pulling out.
49. Rotate the sleeve through 90° and remove.
50. Unscrew the bipod legs axis screw. Tension must be kept on the legs when this is being done, by gripping the *top* of the legs.
51. The bracket and legs will now come apart.
52. Remove the spring from one leg and the stop from the other.
53. Drive out the telescopic leg pin catch.
54. Remove the catch and spring.
55. Pull out the telescopic leg.

#### Trigger Group

56. Remove the change lever by rotating it at 90° and working it out.
57. Drive out the change lever plunger retaining pin.
58. Remove the plunger and spring.
59. Press out the sear axis pin.
60. Remove the sear.
61. Remove the sear spring and post.
62. Press out the trigger axis pin.
63. Pull out the trigger.
64. Drive out the trip lever pin.

65. Remove the trip lever.
66. Drive out the trigger fork pin.
67. Remove the fork and spring.

#### Butt Group

68. Remove the butt plate by pressing down the catch with the point of a bullet.
69. Remove the return spring tube cap by pressing in and rotating.
70. Remove the return spring and rod.
71. Disconnect the spring and rod. (This should not be done by the unit armourer, as it is not "normal stripping.")
72. Remove the butt plate catch by unscrewing the return spring tube nut and then pulling the catch out.
73. Disconnect the catch by pressing together and then out.
74. Remove the spring and pawl.
75. Unscrew the rear swivel plate screw whilst pressure is being put on the buffer.
76. Remove the buffer and spring.
77. Unscrew the front swivel plate screw.
78. Remove the swivel plate and swivel and bracket.
79. Unscrew the bracket mounting screws.
80. Remove the bracket.
81. Unscrew the mounting pin screw.
82. Remove the mounting pin.
83. Disconnect the butt by knocking the pistol grip on the edge of the bench and pulling down on the butt.
84. Remove the cocking handle cover by sliding out.

#### Slide Group

85. Unscrew the pistol grip tube, using the combination tool.
86. Pull off the pistol grip.
87. Unscrew the return spring tube.
88. Remove the buffer spring.
89. Remove the buffer frictioning washer.
90. Unscrew the buffer nut.
91. Remove the buffer.
92. Slide the ejection cover forward until the axis catch pin comes in line with the apertures in the side of the slide.
93. Drive out the axis catch pin.
94. Remove the catch and spring.
95. Unscrew the small mounting pin screw.
96. Remove the ejection cover slide by sliding it out.
97. Remove the mounting pin.



### **The Magazine**

98. Remove the end plate.
99. Take out the guide, spring and platform.
100. Separate the guide, spring and platform by disconnecting.

### **Breech Block**

101. Remove the extractor stay and spring.
102. Take out the extractor.
103. Press the firing pin forward with the thumb, holding the breech block upside down. Turn the breech block on to the right side from the upside-down position. This releases the retainer and allows it to drop.
104. Take pressure off the firing pin, and remove the firing pin and spring.

## **TESTS AND ADJUSTMENTS**

### **1. Cartridge Head Space**

The gauges required are .064-inch and .074-inch. The gun is partially stripped, leaving the barrel assembled to the body. The extractor must be removed from the breech block. Replace piston assembly in gun and test cartridge head space. The breech must close over the .064-inch gauge, but not over the .074-inch. Recheck with spare barrel assembled. If the breech closes over the .074-inch with both barrels, the locking shoulder should be changed. (This is a factory repair.) A new breech block should, of course, be tried first.

### **2. Firing Pin Protrusion**

The positive protrusion of the firing pin is .040 inch low, .045 inch high. This is checked by holding breech block back against piston post and applying the gauge to the face of breech block over the firing pin point.

### **3. Return Spring**

The spring, when compressed, is 16 lb.

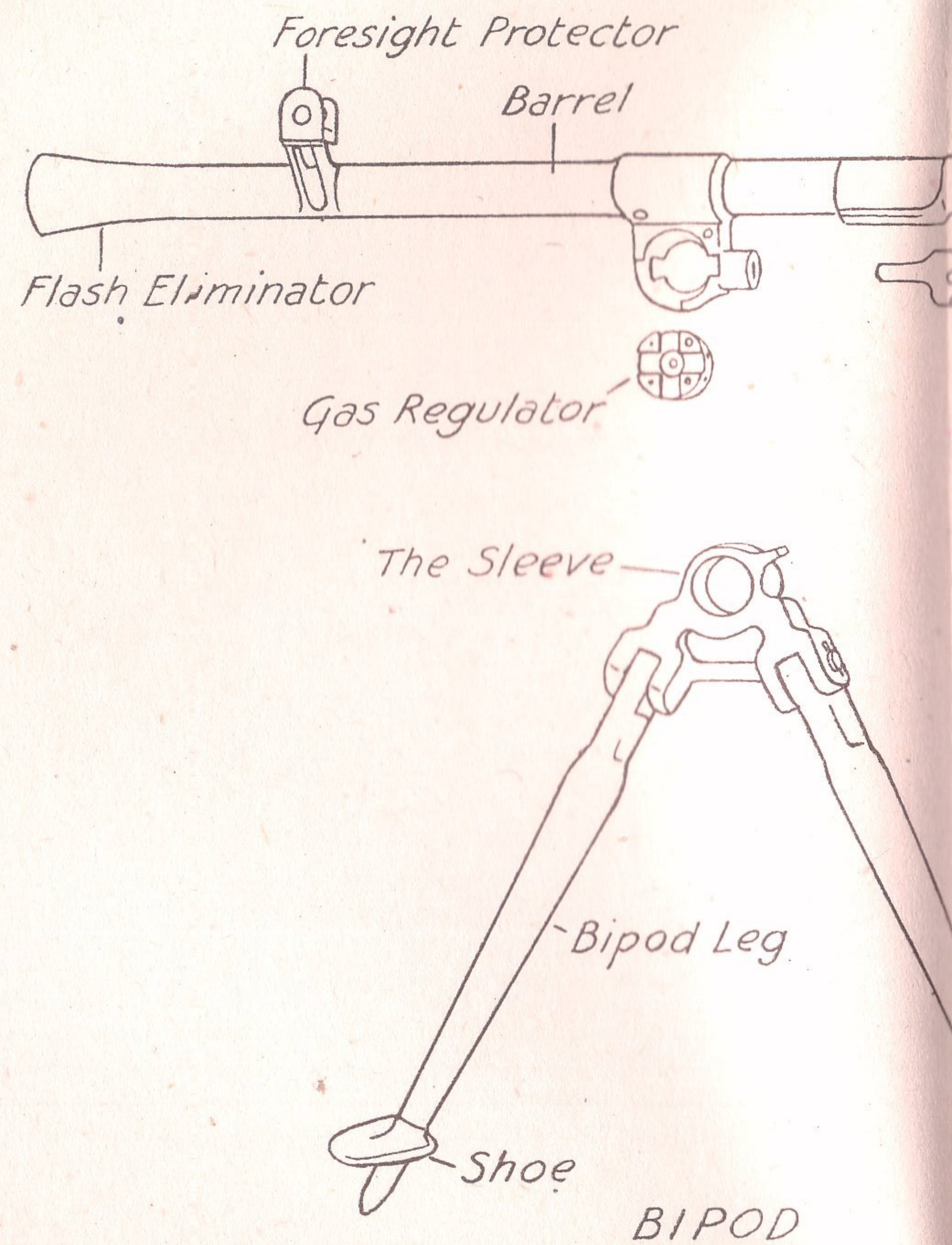
### **4. Barrel Limits**

The serviceability of a barrel is not determined by gauging outside the factory. Three groups of 10 rounds are fired in service bursts. At 200 yards the group must be within a rectangle of 24 inches x 24 inches and the M.P.I. must not be more than 8 inches from the point of aim. At 25 yards the size of the rectangle is 3 inches x 3 inches.

The factory gauging is as follows:

- .301-inch: plug must run.
- .306-inch: plug may run.



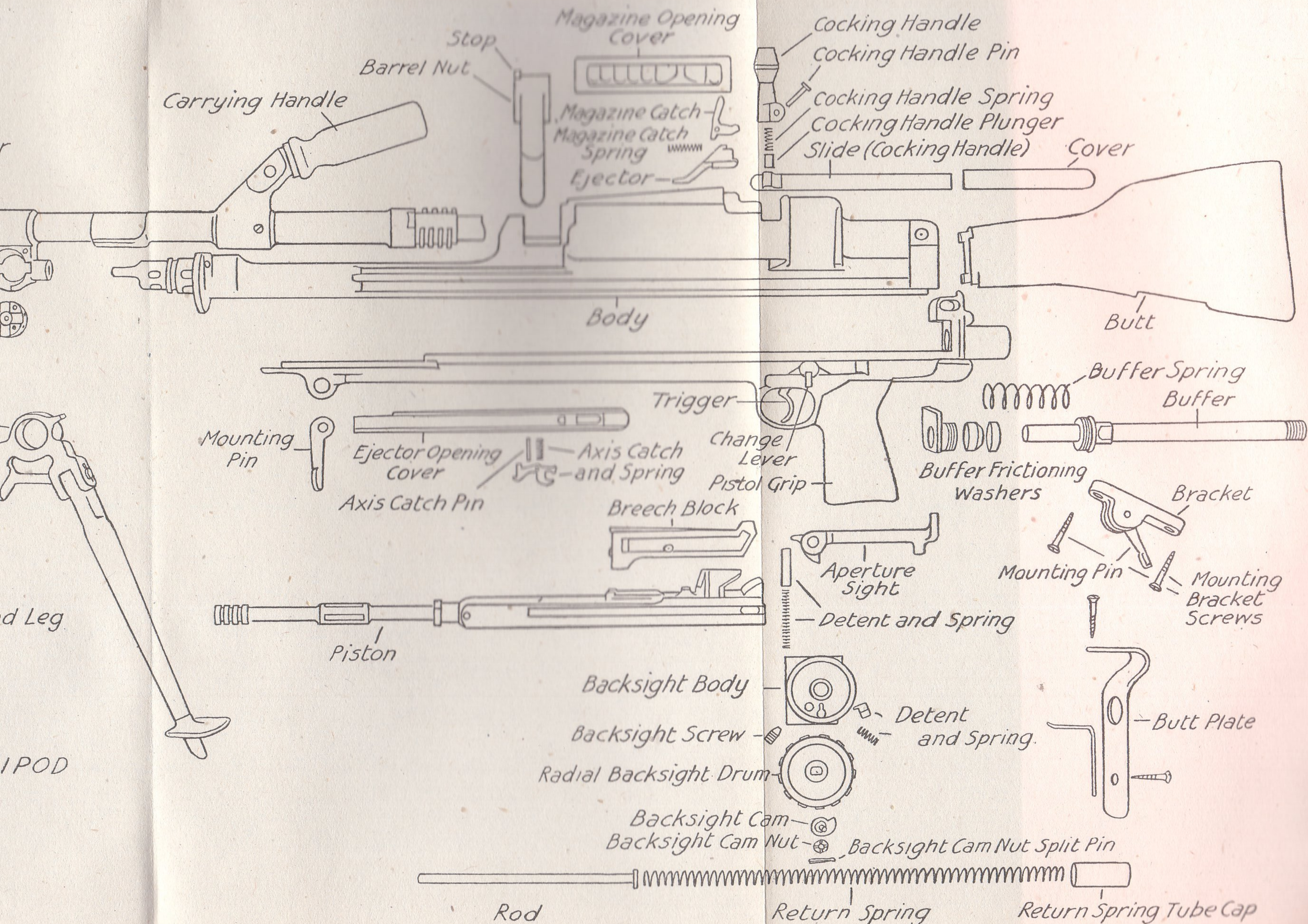


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Plate from "The Armourer's Handbook,  
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Plate I.—THE BREN LIGHT MACHINE GUN MARK I





.307-inch: x  $\frac{1}{4}$  inch at muzzle end.

.309-inch: x 1 inch at breech end.

Lead plug must not enter more than  $\frac{1}{2}$  inch.

Large cone and mouth plugs must not enter more than 1/10th inch.

## STOPPAGES

### *Action.*

1. When the gun fails to fire or stops firing, then cock the gun, change the magazine, aim and fire.

2. When, after the above immediate action, the gun fires one or two rounds and stops again, then cock the gun, remove the magazine. Disconnect the barrel and adjust the gas regulator to the next-largest hole. Replace the magazine and fire.

3. When after immediate action the gun will not fire, then cock the gun and remove the magazine. Look in the body and chamber to see if there is any obstruction.

(i) Should there be an obstruction in the body, then remove it, replace the magazine and fire.

(ii) When there is no obstruction in the body, insert the clearing plug into the chamber, then press the trigger, cock the gun, and remove the clearing plug with the separated case on it. Replace the magazine and fire.

### *Cause.*

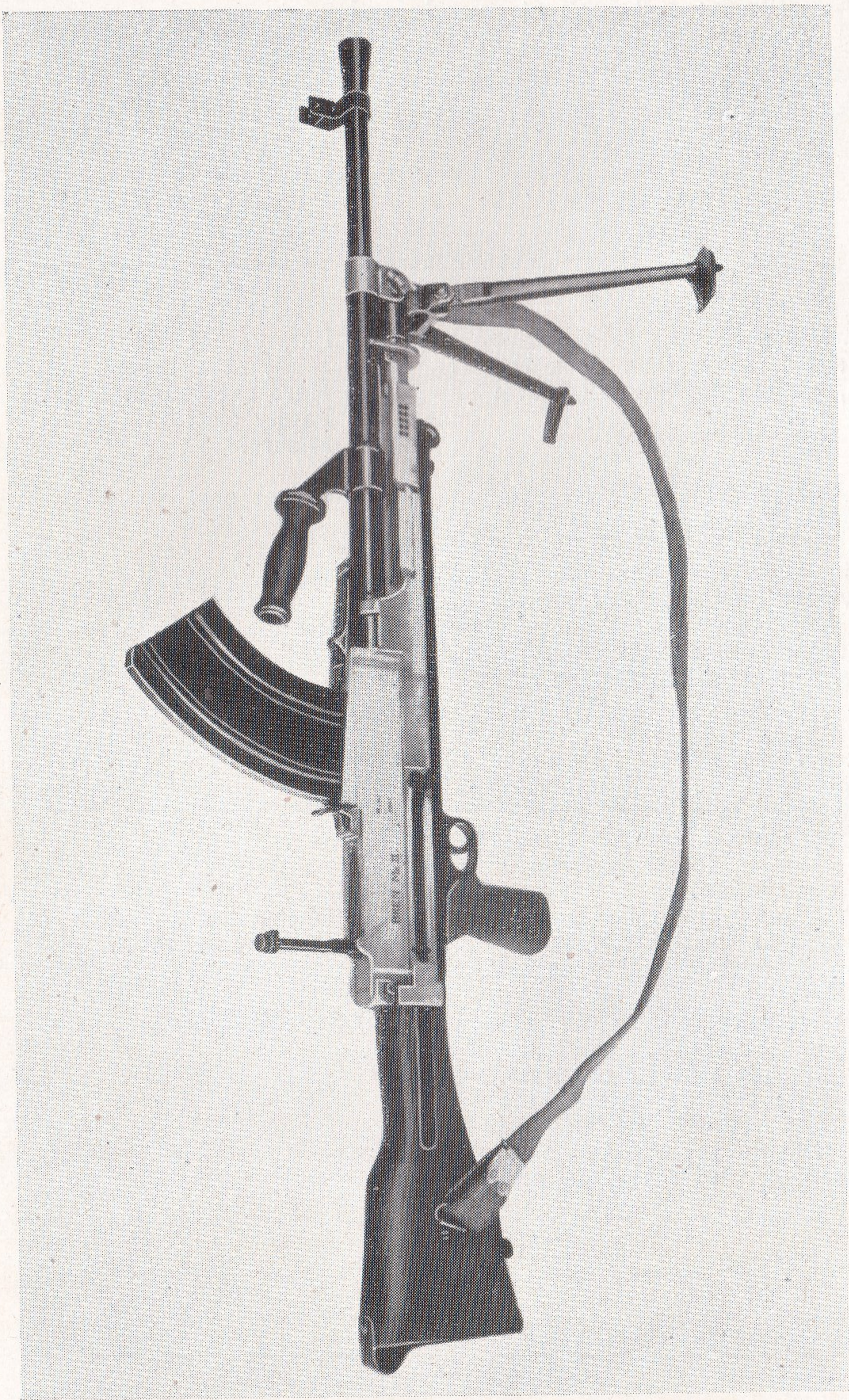
- (i) Empty magazine.
- (ii) Badly filled magazine.
- (iii) Hard extraction.
- (iv) Faulty ejection.
- (v) Misfire.

Insufficient gas.

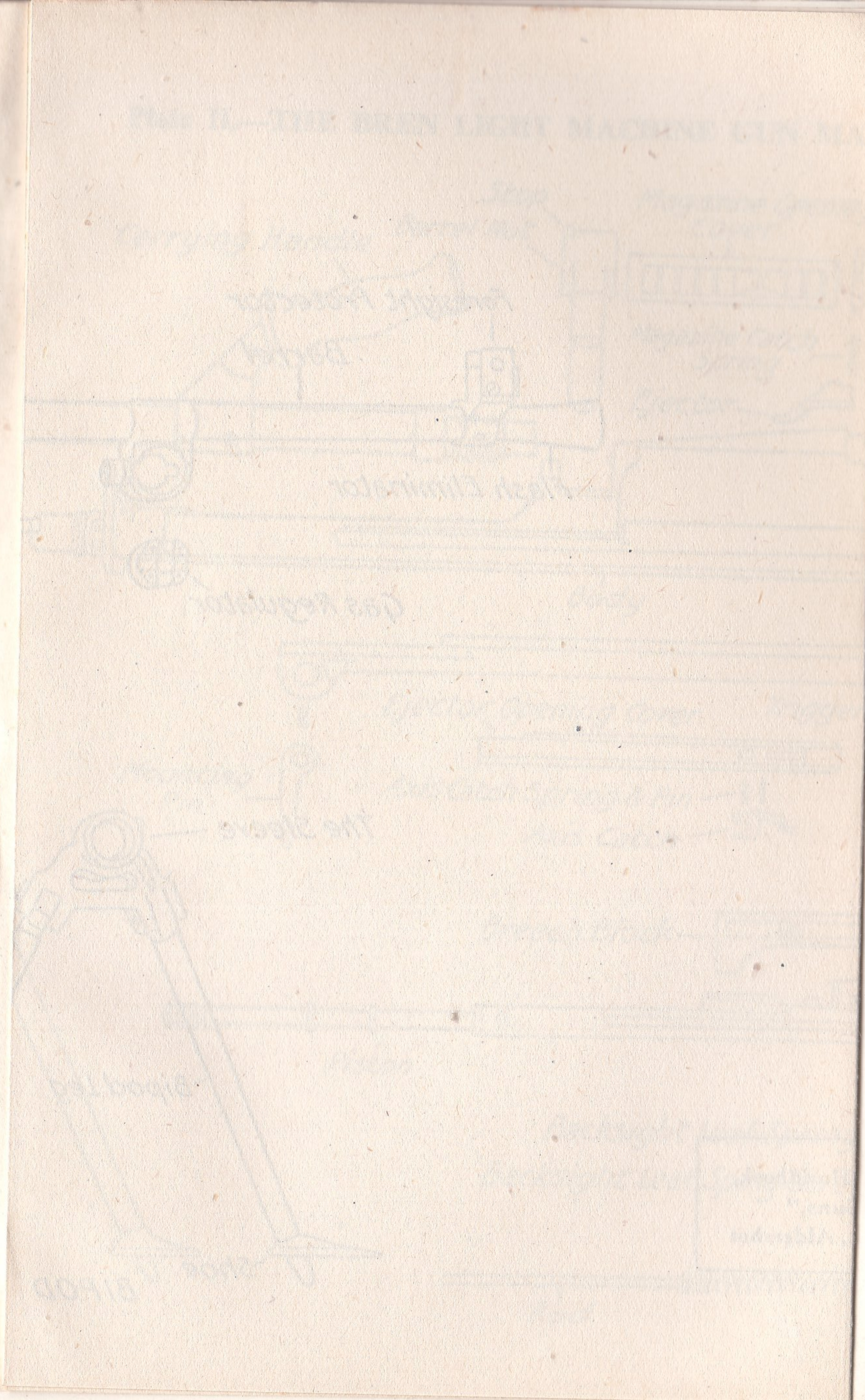
(i) Obstruction caused by mechanical breakdown.

(ii) Separated case.

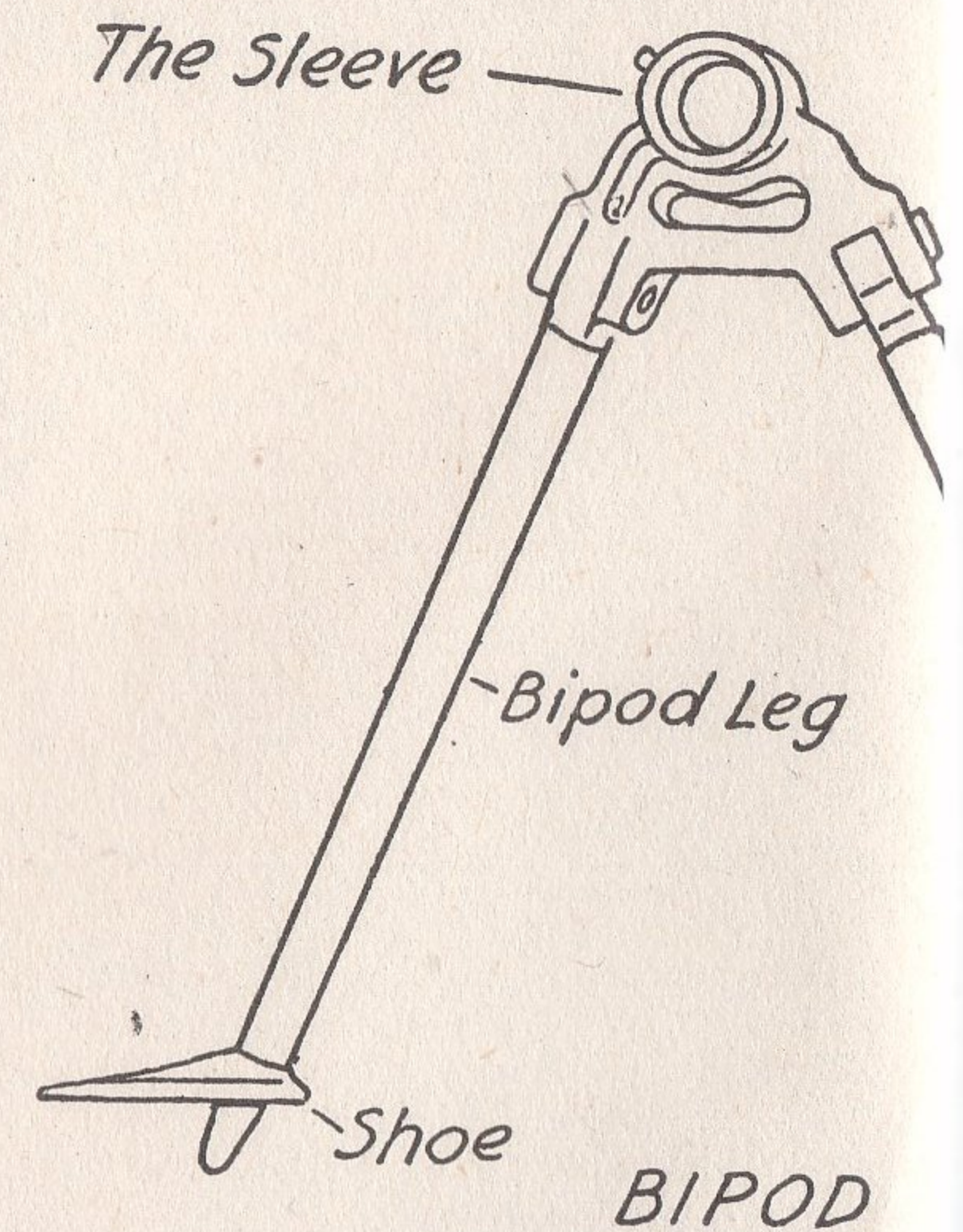
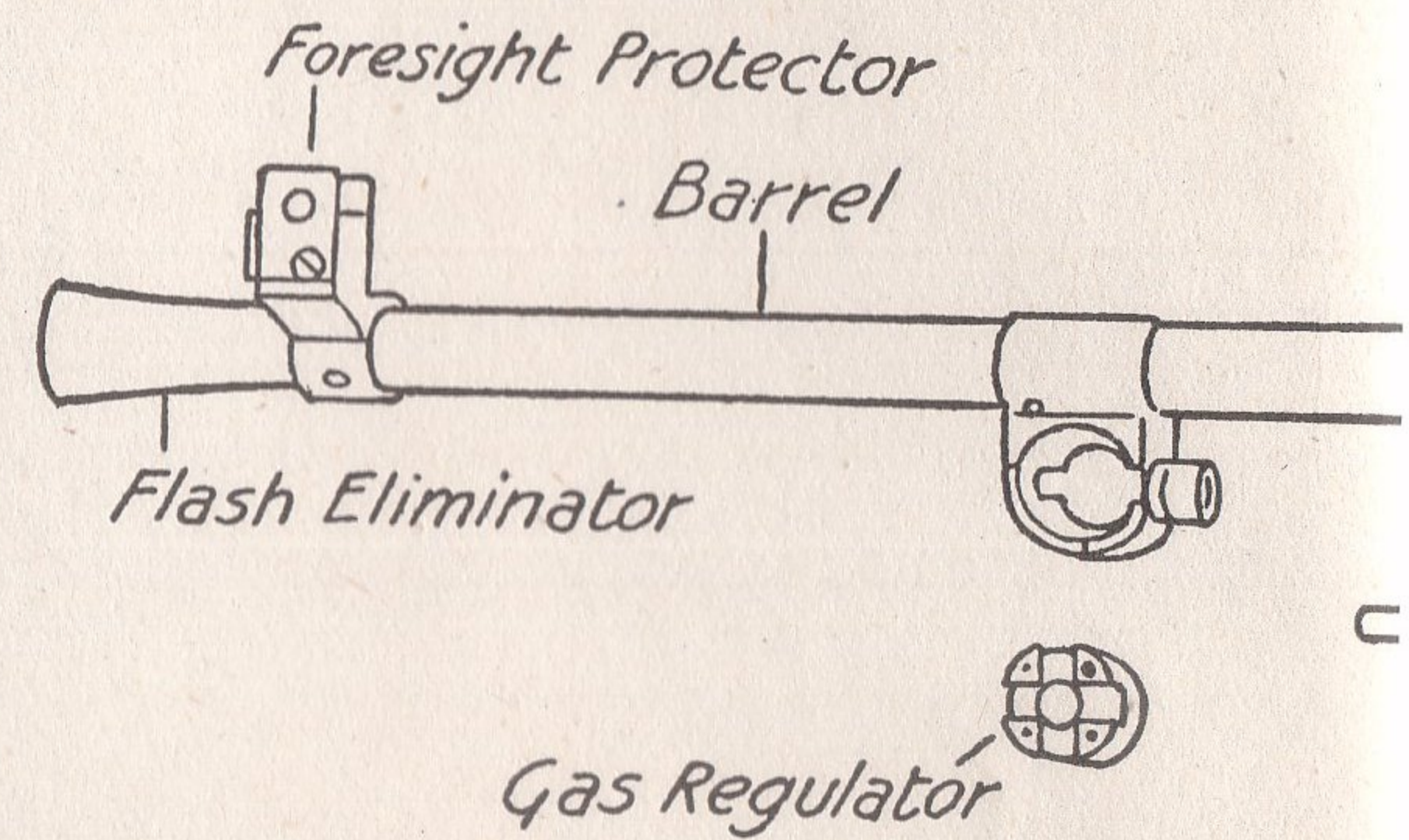




THE BREN LIGHT MACHINE GUN MARK II





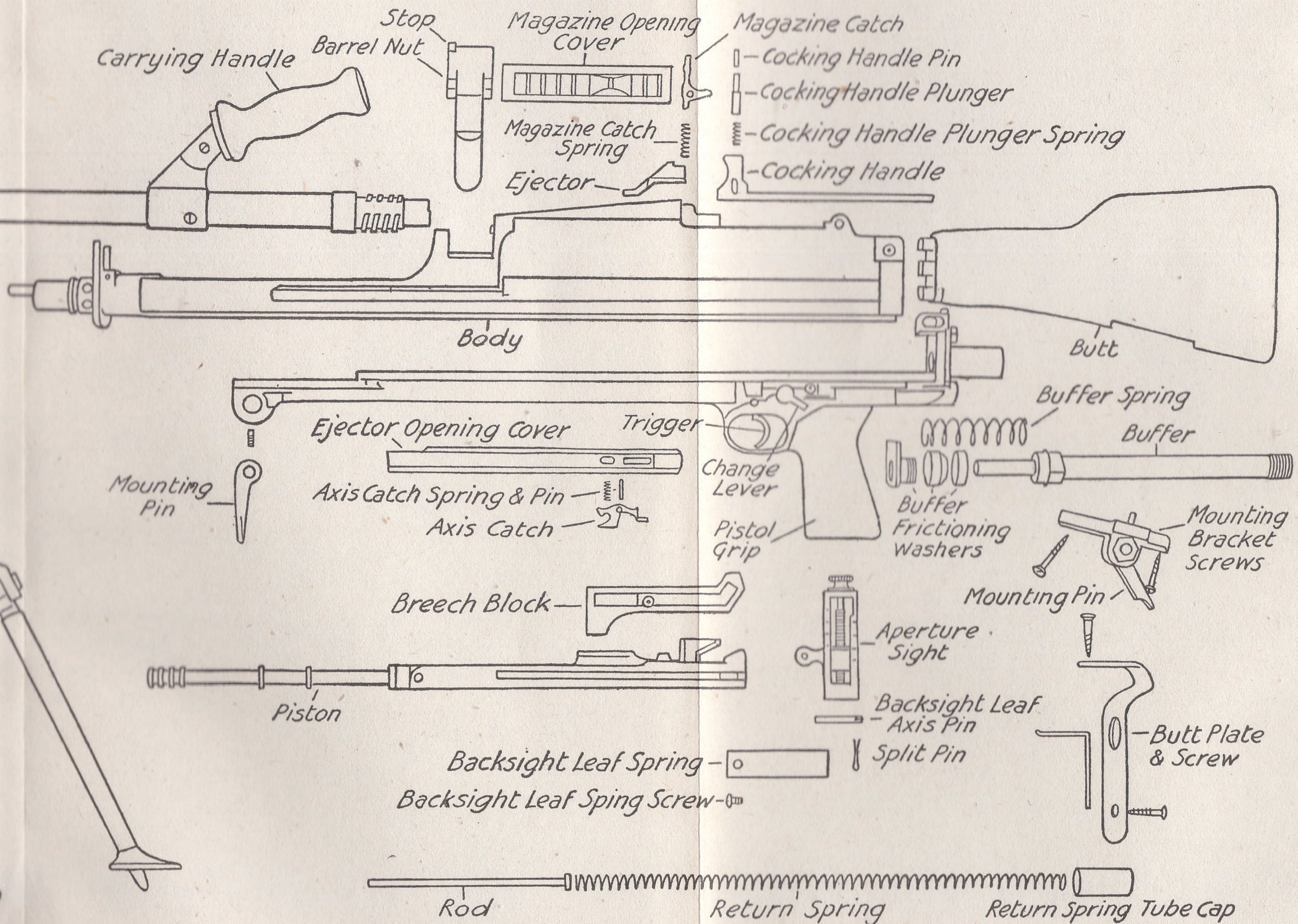


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**Plate II.—THE BREN LIGHT MACHINE GUN MARK II**







THE VICKERS BERTHIER LIGHT MACHINE GUN MARK III

# THE VICKERS BERTHIER LIGHT MACHINE GUN, MARK III

## EXAMINATION OF THE VICKERS BERTHIER LIGHT MACHINE GUN

1. Pull back the cocking handle and ensure that the breech is clear.
2. Check the number which is on top of the body.

### Barrel Group

3. See that the flash eliminator is screwed on tight.
4. Examine the foresight protector and foresight for damage.
5. See that the loop for the sling is not damaged.
6. Ensure that the two gas plugs are tight.
7. See that the gas regulator is tight.
8. See that the gas escape holes in the cylinder are clear of fouling.
9. See that the carrying handle rotates freely and will lock on the underneath position.

### Body Group

10. See that the magazine opening cover spring functions. This is done by locking the cover with the magazine catch, then withdrawing the catch to the rear and allowing the cover to spring back.
11. Make sure that the magazine catch spring functions and that the catch is not broken. Pull back and let go.
12. Raise the backsight and make sure that the spring is functioning correctly. It should lock the V-shaped projection into position.
13. Test the slide backsight screw for distortion by moving up and down.
14. Ensure that the aperture is not damaged.
15. See that the aperture screw is tight.
16. See that the swivel loop on the butt plate is not damaged.
17. Lay the gun on its right side and test the barrel locking pin spring. This is done by pulling out the knob to the rear and rotating upwards until it is clear of the recess on the body. Allow it to return to the recess under control by slightly tapping the knob downwards with the finger.



18. Ensure that the ejector cover is securely held.
19. Test the leaf backsight screw for tightness.
20. Test the ejection cover :
  - (1) For ease of fit in the sliding grooves.
  - (2) For correct tension of the spring retainer by pushing the slide to the rear until it engages in the recess.
21. Test the cocking handle spring catch by cocking the gun. Then push the cocking handle sharply forward and ensure that it is engaged.
22. See that the slot in the cocking handle is not burred, by rotating the knob rearwards on its axis.
23. Examine the body of the cocking handle—upright part for burrs and the stop for damage.

### Trigger Group

24. Lay the gun on its left side and test the trigger guard pin for functioning.
25. Test the change lever plunger spring for correct tension by removing it from one recess in the trigger guard and releasing.
26. See that the grip screws and nuts are tight.
27. Look at the grips for split woodwork.

### Butt Group

28. See that the cocking handle protector slide is not damaged.
29. Test the tripod elevating catch :
  - (1) Spring for correct tension.
  - (2) Lever for fit in woodwork.
  - (3) Bracket screws for tightness.
30. Ensure that the elevating bracket tube is not distorted.
31. See that the two butt plate screws are tight.
32. See that the retainer butt pin at the rear of the body is present.
33. Look at the woodwork on the butt for splits.

### Bipod Group

34. Ensure that the four bipod screws are tight.
35. See that the bracket pin is in position.
36. Examine the tube for distortion.
37. See that the shoes are correct.
38. Test the spring for correct tension, by squeezing in the legs and releasing them.
39. Ensure that the bipod rotates freely on the cylinder.

### The Magazine

40. See that the magazine case is not distorted.
41. Make sure that the end plate is in position.
42. Check the platform for burrs.
43. Check the spring for correct functioning.
44. See that the magazine platform guides are not damaged.

### TO STRIP

#### Barrel Group

1. Cock the gun.
2. Raise the barrel catch vertically. Place the right hand on the carrying handle and raise the barrel muzzle end up. Lift it out.
3. Using tool, remove the flash eliminator by unscrewing. It is a right-hand thread.
4. Unscrew the foresight bracket nut.
5. Pull off the foresight bracket, comprising the foresight and protector.
6. Using a spanner, unscrew :
  - (1) The gas regulator.
  - (2) The gas regulator chamber plug.
  - (3) The gas plug. (The gas plug port could be taken out, but this is not advisable.)
7. Unscrew the eye sling.
8. Drive out the gas block pin.
9. Remove the gas block.
10. Knock out the carrying handle pin and remove the screw.
11. Pull off the carrying handle forwards.

#### Body Group

12. Squeeze the trigger with the forefinger of the left hand and allow the recoiling portions to move forward under control.
13. Rotate the trigger guard locking pin and withdraw it.
14. Remove the butt and trigger groups as one.
15. Pull out the return spring, piston and breech block.
16. Rotate the barrel locking pin clockwise.
17. This enables the gas cylinder to be withdrawn from the body.
18. Drive out the nut screw retaining pin on the bipod.
19. Unscrew the nut and pull out the screw.
20. The bipod legs and hinge are now withdrawn from the bipod bracket.

} Bipod Group.



21. Drive out the bipod bracket pin.
22. Remove bipod bracket from the cylinder.
23. Unscrew the three hinge screws.
24. Pull out the bipod legs, collar and spring.
25. Remove the barrel locking pin by rotating it clockwise to nine o'clock and pull out.
26. Slide off ejection opening cover.
27. Punch out the cocking handle knob pin.
28. Remove the cocking handle knob.
29. Remove the knob catch spring.
30. Drive out the two cocking handle body pins.
31. Remove the cocking handle body.
32. Remove the ejector cover on the left side of the body by prising up and withdrawing it to the rear.
33. Rotate the ejector outwards and remove.
34. Remove the backsight nut and screw.
35. The tangent backsight now comes out.
36. Drive out the milled head retainer (pin, head, screw backsight).
37. Remove the milled head.
38. Remove the backsight head screw spring.
39. Remove the aperture backsight plate screw nut.
40. Remove the screw and plate.
41. Drive out the magazine opening cover retaining pin.
42. Remove the magazine opening cover.
43. Pull back the magazine catch slide.
44. Lift up the magazine catch lever.
45. Drive out the fixing pin.
46. Using a punch, drive out the magazine catch lever pin and withdraw the spring.
47. Remove the magazine catch pawl.
48. Slide out the bush from the magazine catch pawl.
49. Drive out the breech block catch pin.
50. Unscrew the magazine catch screw.
51. Remove the magazine catch spring and catch.
52. Take out the breech block catch.
53. Remove the breech block catch spring.

**Bipod Group**  
(continued)

**Cocking Handle Group.**

**Backsight Group.**

**Magazine Catch Group.**

**Trigger Group**

54. Rotate the change lever downwards and pull out.
55. The trigger guard side plate now comes off.
56. Lift up the sear and remove sear and spring.
57. Using a screwdriver to compress it, remove the trigger spring.
58. Lift out the trigger.
59. Remove the sear axis bar.
60. Undo the pistol grip side pieces screw nuts.
61. Unscrew the pistol grip side pieces screws.

**Butt Group**

62. Unscrew the two butt catch bracket screws.
63. Pull out the butt catch bracket and butt catch.
64. Drive out the butt catch pin.
65. Remove the butt catch spring.
66. Unscrew the upper butt plate screw.
67. Unscrew the lower butt plate screw. (This is common to the butt catch bracket screws.)
68. Remove the butt plate.
69. Drive out the buffer pin with a punch.
70. Pull out the buffer and the buffer spring.
71. Drive out the butt stock pin.
72. Remove the butt.
73. Tap out the cocking handle cover.
74. The return spring tube can be unscrewed if not welded into position.

**Breech Block**

75. Unscrew the firing pin screw.
76. Remove the firing pin and spring.
77. Push forward the extractor spring guide with a screwdriver and take out.
78. Pull out the extractor.
79. Shake off the extractor spring.
80. Drive out the feed piece pin.
81. Remove the feed piece and spring.

**The Magazine**

82. Remove the end plate.
83. Take out the guide, spring and platform.
84. Separate the guide, spring and platform by disconnecting.



## TESTS AND ADJUSTMENTS

### 1. Cartridge Head Space

The gauges required are .064-inch and .076-inch.

The gun is stripped as for cleaning. The extractor and spring are removed from the breech block.

The barrel is replaced and a careful check made to ensure that it is correctly engaged. The recoiling portions are replaced. The recoiling portions are operated by means of the piston to ensure that the breech closes freely.

The compression of the firing pin should be felt as the piston head enters the gas block.

The .064-inch gauge is inserted into the chamber.

The recoiling portions are operated by means of the piston and should close the breech freely.

Now take out the .064-inch gauge and put in the .076-inch gauge.

When the recoiling portions are operated as before:

- (1) The breech should not close.
- (2) The breech block should not rise up fully in front of the locking shoulder.
- (3) The head of the piston should not enter the gas block.

Remove the barrel and repeat the above tests, using the spare barrel.

When the breech closes over the .076-inch gauge then:

- (1) The barrel joint has become worn.
- (2) The locking shoulder is worn.

The gun must be returned to the factory.

### 2. Striker Protrusion

The gauges required are .046-inch and .054-inch.

The recoiling portions, the extractor and spring are all removed.

The piston post must be forced up against the firing pin to compress the spring.

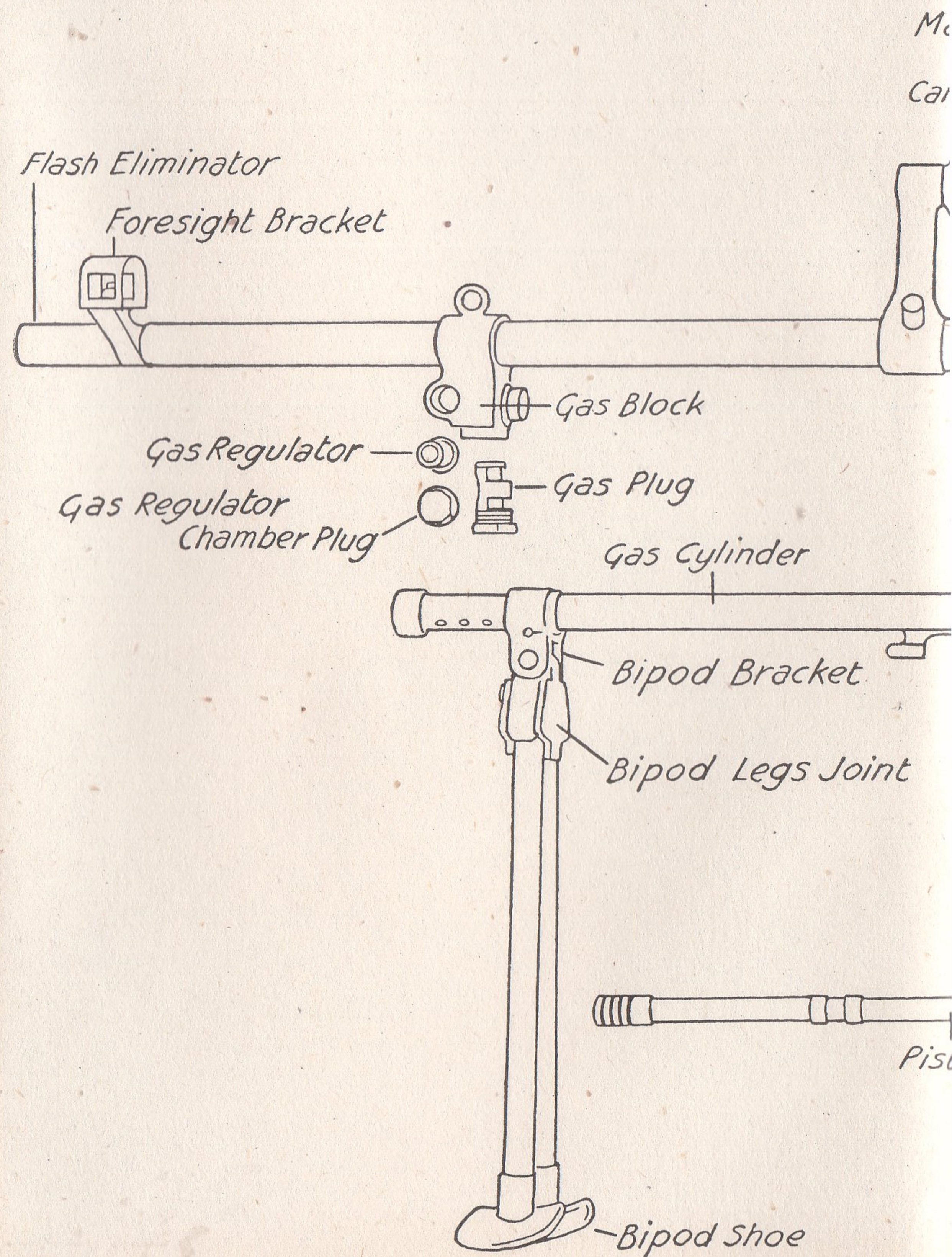
Test in the usual manner.

*Note.*—The protrusion can be tested roughly by the impact of the firing pin on the base of a dummy.

### 3. Return Spring

A weak return spring must be sent in for exchange. There is no remedy. The weight should be 5 to 7 lb. in the forward position, and 15 to 17 lb. in the rear position.



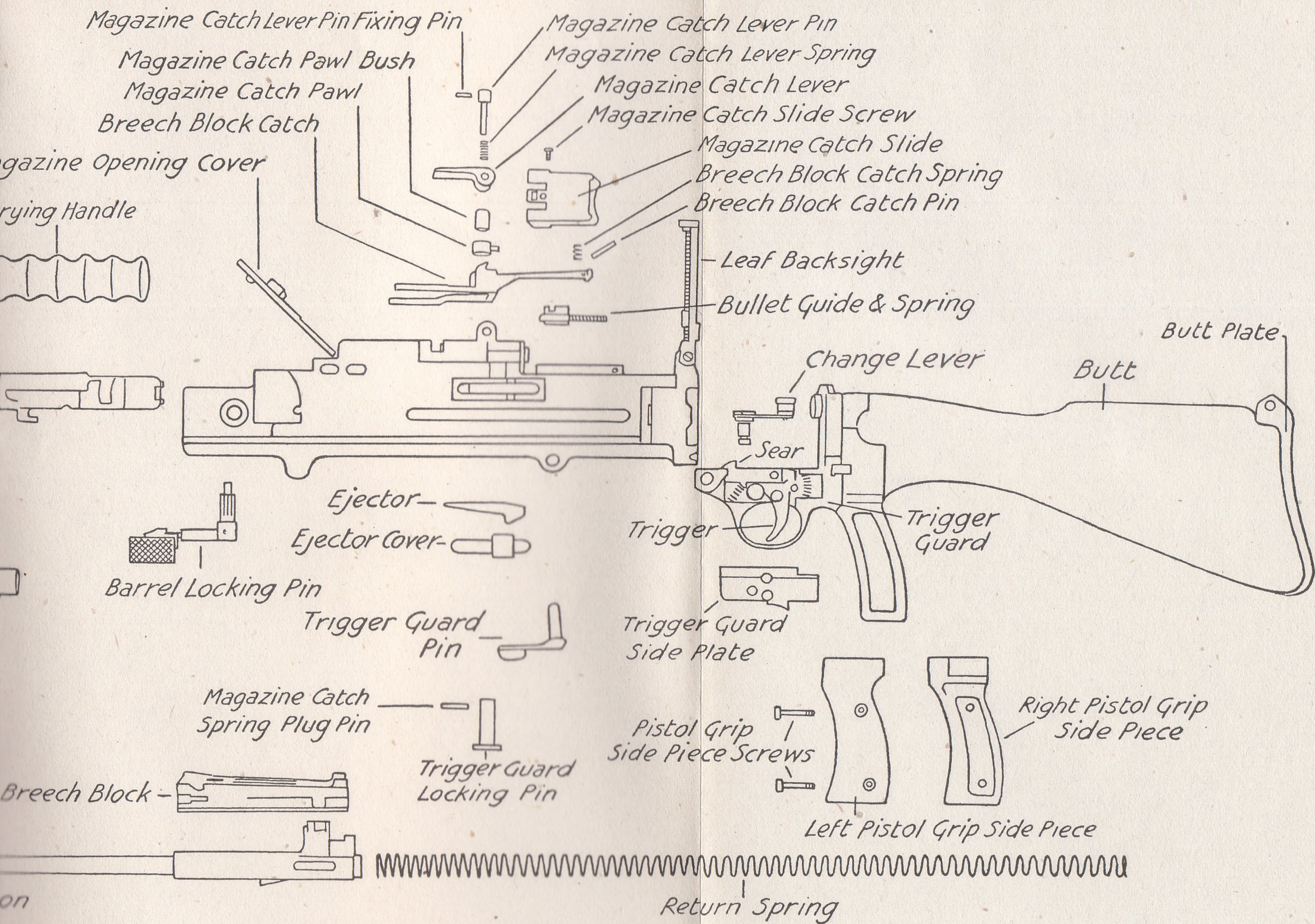


To face page 22

Plate from "The Armourer's Handbook,  
Part III, Light Machine Guns,"  
published by Gale & Polden Ltd., Aldershot



# THE VICKERS BERTHIER LIGHT MACHINE GUN MARK III





#### 4. Barrel Limits

.303-inch: plug must run.

.306-inch: plug may run.

.307-inch: x  $\frac{1}{4}$  inch at muzzle end.

.309-inch: x 1 inch at breech end.

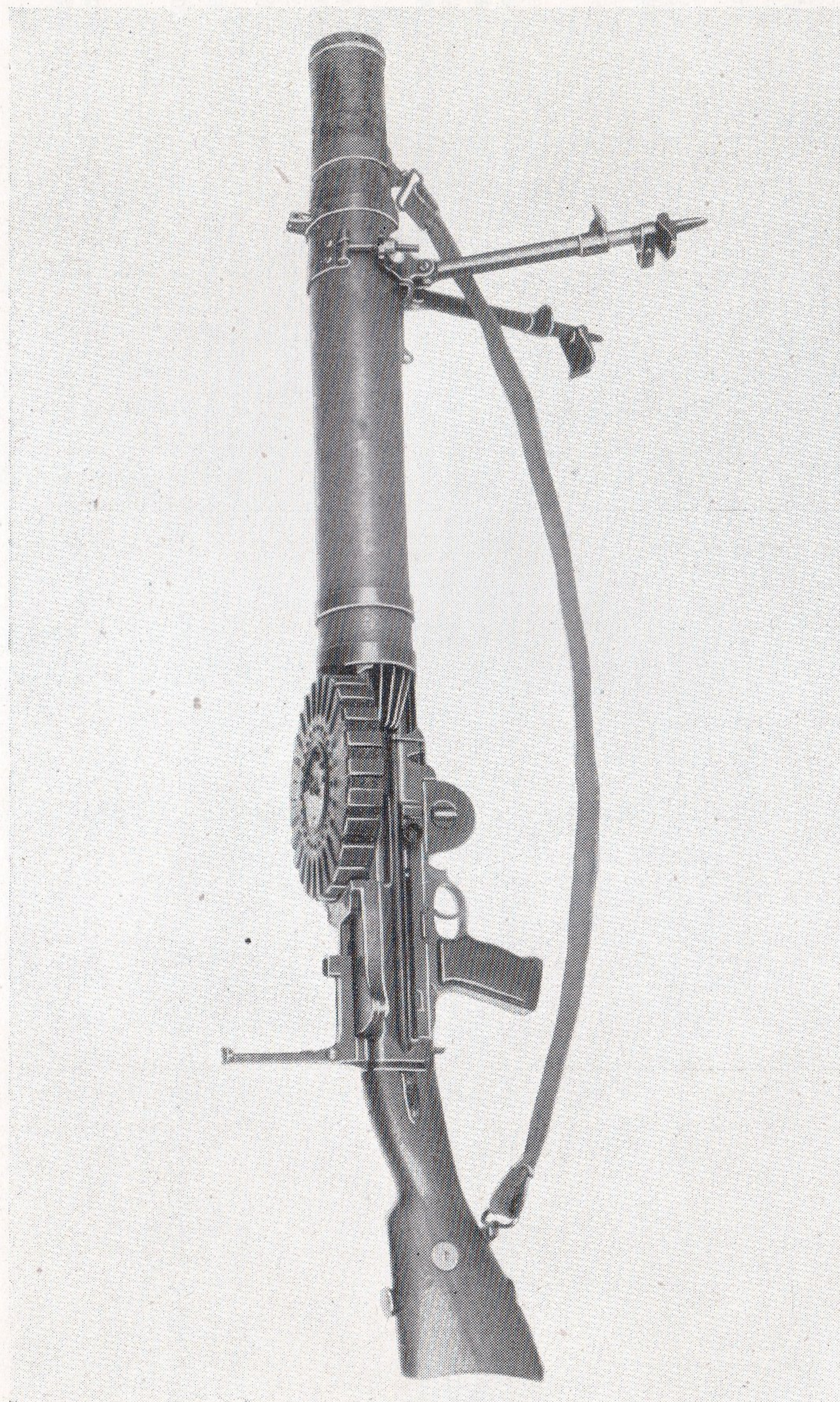
Head plug must not enter more than  $\frac{1}{2}$  inch. Large cone and mouth plugs must not enter more than 1-10 inch.



## STOPPAGES

<i>Position of the Breech Block.</i>	<i>Cause.</i>	<i>Remedy.</i>
Approximately quarter of the breech block is seen through the ejection opening.	<p>(1) The magazine either incorrectly filled or placed on. The nose of the bullet is unable to pass under the bullet guide.</p> <p>(2) Interlocking cartridge rims.</p>	<p>(1) Cock the gun. Remove magazine. Make sure that the cartridge is correctly positioned. Replace magazine and carry on firing.</p> <p>(2) Cock the gun. Remove magazine. Either remove the second round in the magazine or position it correctly—rim behind rim. Replace magazine and carry on firing.</p>
Approximately half of the breech block is seen through the ejection opening.	<p>(1) The round is not cleared from the magazine owing either to friction in the gun mechanism or sand in the magazine.</p> <p>(2) Displaced round in the magazine. The round may either fall into the body, or the nose of the bullet drop out of alignment with the chamber, thus causing a misfeed.</p> <p>(3) Failure to eject the fired cartridge. Prevents the next round being fed.</p>	<p>(1) Carry out immediate action, <i>i.e.</i>, cock the gun and fire. Should the stoppage recur, change the magazine. (<i>Note.</i>—This magazine must be cleaned before reuse; also thoroughly oil the piston through the top opening.)</p> <p>(2) Cock the gun. Remove magazine. Replace the round in position or remove loose round from the body. Replace the magazine and continue firing.</p> <p>(3) Cock the gun. Take off magazine.</p> <p>(a) Remove the empty case and partially fed round, and replace magazine and carry on firing.</p> <p>(b) Should the stoppage recur, either change the extractor spring or the breech block.</p>
<p>(4) Misfeed owing to the nose of the bullet not entering the chamber.</p> <p>(5) Failure to extract the empty case. Probable cause is a broken extractor.</p>	<p>(4) Misfeed owing to the nose of the bullet not entering the chamber.</p> <p>(5) Failure to extract the empty case. Probable cause is a broken extractor.</p>	<p>(4) (a) Remove magazine. Clear round from the body. Replace magazine and continue firing.</p> <p>(b) Should the stoppage recur with the same magazine, change the magazine. (<i>Note.</i>—The magazine must be adjusted by the armorer.)</p> <p>(5) (a) Remove the magazine. Clear the partially fed round in the magazine and remove the empty case from the chamber. Replace the extractor or breech block.</p> <p>(b) Should the rim of the cartridge be torn, either change the barrel or clear the empty case, using a cleaning rod.</p>
About three-quarters of the breech block is seen through the ejection opening.	<p>(1) Misfeed owing to a thick-rimmed cartridge that is unable to slide under the extractor.</p> <p>(2) Separated case.</p>	<p>(1) Cock the gun to clear the round. Should the stoppage be repeated, change the extractor or breech block.</p> <p>(2) Cock the gun. Should part of the case be left in the chamber:</p> <p>(a) Remove by using clearing plug.</p> <p>(b) Change the barrel. Should the separation be repeated, change the breech block.</p>
High feed-piece.	(3) High feed-piece.	(3) Cock the gun. Change the breech block. When a chance occurs, change the feed-piece and feed-piece pin.
Misfire.	(1) Misfire.	(1) Cock the gun. Continue firing. Should the stoppage recur frequently, change the breech block or the firing pin.
Failure to feed.	(2) Failure to feed.	(2) Cock the gun. Continue firing. Should the stoppage be repeated, change the magazine.





THE LEWIS LIGHT MACHINE GUN .303-INCH MARK I

## LEWIS GUNS

There are four types:

- (1) .303-inch British (ground pattern).
- (2) .303-inch British (stripped pattern).
- (3) .300-inch American (ground pattern).
- (4) .300-inch American (stripped pattern), modified in Great Britain for ground use.

No. 2 is similar to No. 1 except that the gun has been lightened and altered as follows:

- (a) Radiator and radiator casing removed.
- (b) Shorter butt (2 inches).
- (c) A steel guard incorporated to protect the gas cylinder.
- (d) The fixing of a front hand grip.

No. 3 is almost identical with No. 1.

No. 4 differs from the others, so has been written up in detail. A red band is painted on the two American pattern guns, to distinguish them from the British ones.

## LEWIS LIGHT MACHINE GUN ·303-INCH MARK I

### EXAMINATION OF THE LEWIS GUN

1. Pull back the cocking handle and ensure that the breech is clear.
2. Check the number which is on top of the body.

#### Barrel Group

3. Examine the front radiator casing for distortion.
4. Ensure that the sling swivel screw is tight.
5. Examine the sling swivel.
6. Examine the rear radiator casing for distortion.
7. Test the clamp ring foresight protectors to see they are not damaged.
8. See that the clamp ring is not distorted.
9. See that the foresight is not damaged and is correctly assembled.
10. See that the gas regulator key and gas regulator are in position.
11. Ensure that the barrel mouthpiece is present.



### Body Group

12. See that the stop pawls and feed pawl are not broken or incorrectly assembled.
13. Check the cartridge guide spring for correct tension.
14. See that the feed arm catch is not broken.
15. Make sure that the magazine key is not burred.
16. See that the tangent backsight pin and washer are in position.
17. Check the aperture sight for distortion.
18. See that the milled head fixing pin is in position.
19. Rotate the milled head and test that the spring functions correctly and the screw is not distorted.
20. Ensure that the backsight bed screw is in position.
21. Rotate the tangent leaf and ascertain that the spring functions.
22. Ensure that the right and left dust covers are assembled correctly.
23. Pull back the cocking handle and check the safety device on the dust cover.
24. See that the butt catch spring functions correctly.
25. Look at the cocking handle for distortion.
26. Cock the gun and fire.
27. See that the body locking pin is in position.

### Field Mount (Bipod) Group

28. Ensure that the field mount is correctly assembled.
29. Examine the T-piece and see that the threads are not stripped.
30. Make sure that the wing nut screws the band tight to the gun.
31. Check the six rivets and see that they are secure.
32. See that the bipod legs axis screws are tight.
33. See that the leg tubes are not distorted.
34. Make sure that the wing screws on the legs are not stripped.
35. Test the telescopic legs.
36. Ensure that the shoe pins are not broken, and that the shoes function correctly.
37. Examine the catch spring for distortion.
38. See that the nut legs and screw on the legs catch are in position.

### Trigger and Pinion Group

39. See that the sear and trigger axis pins are in position.
40. Look at the trigger tail and guard for distortion.
41. See that the grips are not split.

42. Ensure that the pinion screw is assembled correctly.
43. Look at the pinion casing for distortion.

### Butt Group

44. See that the following screws are tight:
  - (a) Three cruciform screws.
  - (b) Four bracket swivel screws.
  - (c) One swivel screw.
  - (d) Two butt plate screws.
45. Look at the swivel sling for distortion.
46. See that the butt plate is not damaged.
47. Check the oil bottle nut for tightness.
48. See that the oil brush is present.
49. Look at the butt for splits.

### The Magazine

50. See that the catch spring functions correctly.
51. Check that the catch is not broken.
52. Look at the pan for distortion.
53. See that the separating pegs are not broken or damaged.
54. Check the centre block for fracture.
55. See that the cartridge retainers are not broken or distorted.
56. Check all rivets for tightness.

### TO STRIP

#### Barrel Group

1. Unscrew the foresight band screw.
2. Remove the band.
3. Slide off the front radiator casing.
4. Unscrew the swivel screw.
5. Take off the band and swivel.
6. The positioning stud on the foresight band can be unscrewed by using the rear end of the barrel mouthpiece spanner.
7. Tap off the foresight blade.
8. Unclamp the bipod.
9. Undo the bipod leg screws.
10. Remove the bipod telescopic legs.
11. Drive out the shoe pins.
12. Remove the shoes.
13. Unscrew the bipod legs clip and remove.
14. Remove the split pins from the legs axis screws.
15. Unscrew the legs axis screws.
16. Remove the bipod legs tubes.

Field  
Mount  
(Bipod)  
Group.



17. Using a screwdriver, lever up and remove the gas regulator key.
18. Remove the gas regulator.
19. Remove the barrel mouthpiece (left-handed thread).

NOTE.—*The gun must now be further stripped before continuation of stripping the barrel group, i.e.:*

- (i) Remove the butt by pressing in the catch and rotating it to the left (the gun is upside down).
  - (ii) Pull out the trigger group.
  - (iii) Disconnect the pinion group and take it off.
  - (iv) Pull back the cocking handle to the rear and draw it out.
  - (v) Slide out the bolt and piston.
  - (vi) Remove the body locking pin.
  - (vii) Unscrew the body to the left.
20. Remove the rear barrel casing.
  21. Unscrew the gas cylinder anti-clockwise.
  22. Unscrew the gas chamber.
  23. Put the jack and collar on the rear end of the barrel and tap it clockwise. This will withdraw the barrel from the radiator.
  24. Remove the barrel band.
  25. The radiator now remains.

### Body Group

26. Rotate the feed arm over to the right.
27. Withdraw the body cover to the rear and remove.
28. Push down with the nose of a bullet and remove the cartridge guide.
29. Push in with the nose of a bullet and remove the magazine stop pawl spring.
30. Tap the body cover on the bench and the right and left stop pawls will fall out.
31. Remove the split pin from the tangent back-sight axis pin.
32. Remove the washer axis pin.
33. Take out the axis pin.
34. Drive out the milled head pin.
35. Remove the milled head and spring.
36. Pull out the elevating screw.
37. Take off the aperture block.
38. Unscrew the backsight bed screw.
39. Remove the backsight bed spring.
40. Drive off the backsight bed.

Backsight  
Group.

41. Remove the feed arm by rotating the latch.
42. Take off the feed arm pawl and spring.
43. Remove the ejector cover by inserting a bullet in the aperture and lifting up and pulling to the rear.
44. Remove the ejector.
45. Remove the dust covers—right and left—by raising the covers up to the highest position and inserting a screwdriver.

### Trigger Group

46. Drive out the butt catch pin.
  47. Remove the butt catch and spring.
  48. Drive out the sear axis pin.
  49. Remove the sear.
  50. Drive out the trigger axis pin.
  51. Remove the trigger.
  52. Remove the trigger plunger and spring.
- Note.—The grips cannot be removed.

### Butt Group

53. Unscrew the oil brush.
54. Unscrew the oil tube, using a special tool.
55. Remove the oil tube and nut.
56. Unscrew the three cruciform screws.
57. Remove the cruciform.
58. Unscrew the butt plate screws.
59. Remove the butt plate.
60. Unscrew the swivel screw.
61. Remove the swivel.
62. Unscrew the four swivel bracket screws.
63. Remove the bracket.

### The Bolt

64. Remove the two extractors by levering off with a screwdriver.
65. Unscrew the actuating stud.

### The Piston

66. Drive out the striker fixing pin.
67. Remove the striker.



### **Pinion Group**

68. Release the tension off the return spring by disconnecting the pinion pawl from the pinion.

69. Remove the pinion screw.

70. Take out the pinion from the casing.

71. Separate the pinion from the pinion casing. This is done by placing the screw in the hub and forcing the casing away from the pinion.

72. Remove the hub.

73. Drive out the pinion pawl axis pin.

74. Remove the pawl and spring.

*Note.*—The return spring must not be removed.

### **The Magazine**

75. No attempt must be made to strip any portion of the magazine.

## **TESTS AND ADJUSTMENTS**

### **1. Cartridge Head Space**

The gauges required are .064-inch and .074-inch .

The gun is partially stripped, leaving the barrel assembled to the body. The extractors must be removed from the bolts.

Test the gun bolt and the spare bolt, which should turn over the .064-inch gauge but not over the .074-inch gauge. If either of the bolts turns over with the .074-inch gauge, test with the gauge bolt. If this also turns over, the barrel will probably be found unserviceable.

When the cartridge space is .074 inch or more, the special breech end of the barrel with locking piece will be applied in conjunction with the gauge bolt, and if the body is found serviceable a new barrel will be selected. If a suitable barrel is unavailable, report. The unserviceable barrel must be reported in every case.

*Note.*—The unit armourer will not be able to do the above, and the gun must be sent back to the workshops for it to be carried out.

### **2. Striker Protrusion**

Height of protrusion is .037 inch low and .043 inch high.

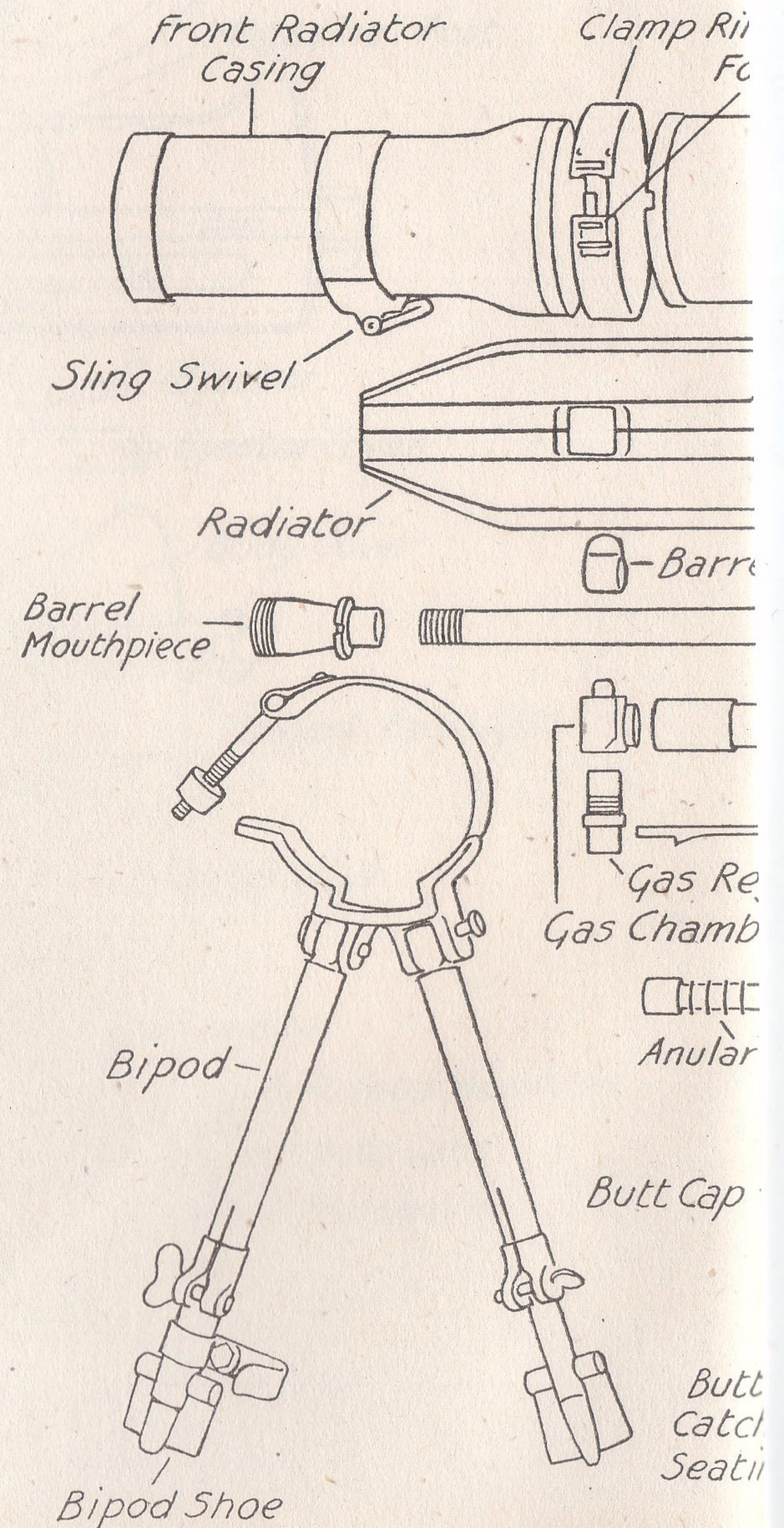
Remove the extractors and then assemble bolt, together with actuating stud, on piston rod and gauge protrusion of striker.

### **3. Return Spring**

The pull-off from the cocking handle should be 12 to 14 lb. in the fired position.



**Plate IV.—THE LEWIS LIGHT**

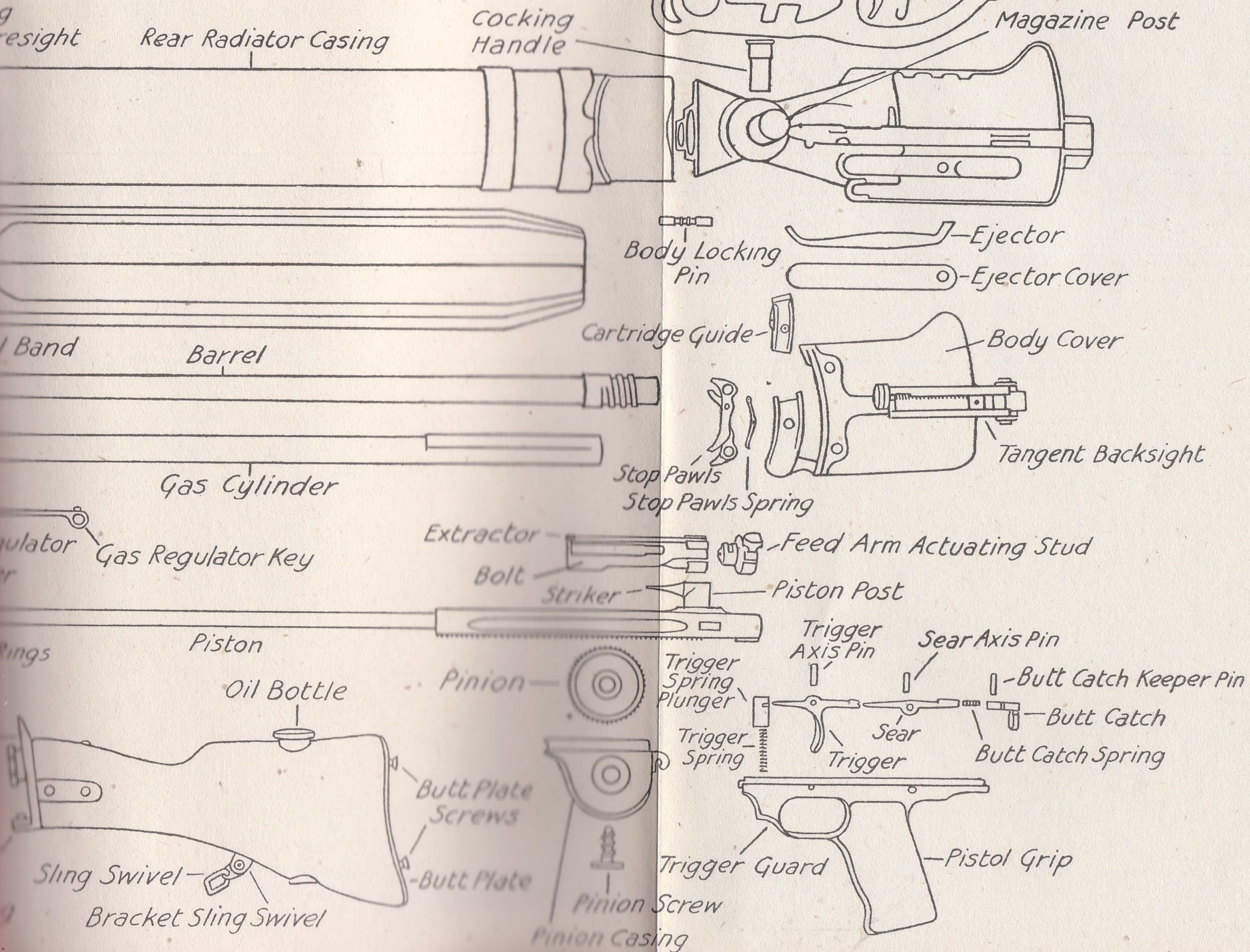


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Plate from "The Armourer's Handbook,  
Part III, Light Machine Guns,"  
published by Gale & Polden Ltd., Aldershot



# T MACHINE GUN .303-INCH MARK I





#### 4. Barrel Limits

The serviceability of a barrel is not determined by gauging outside the factory. Three groups of 10 rounds are fired in service bursts. At 200 yards the group must be within a rectangle of 24 inches x 24 inches and the M.P.I. must not be more than 8 inches from the point of aim. At 25 yards the size of the rectangle is 3 inches x 3 inches.

The factory gauging is as follows:

.303-inch: plug must run.

.305-inch: plug may run.

.309-inch: x  $\frac{1}{2}$  inch at the muzzle end.

.310-inch: x 8 inches at the breech end.

These figures are different from the Bren gun ones.

*Note.*—A worn barrel will be marked with the letter “W” in front of the collar

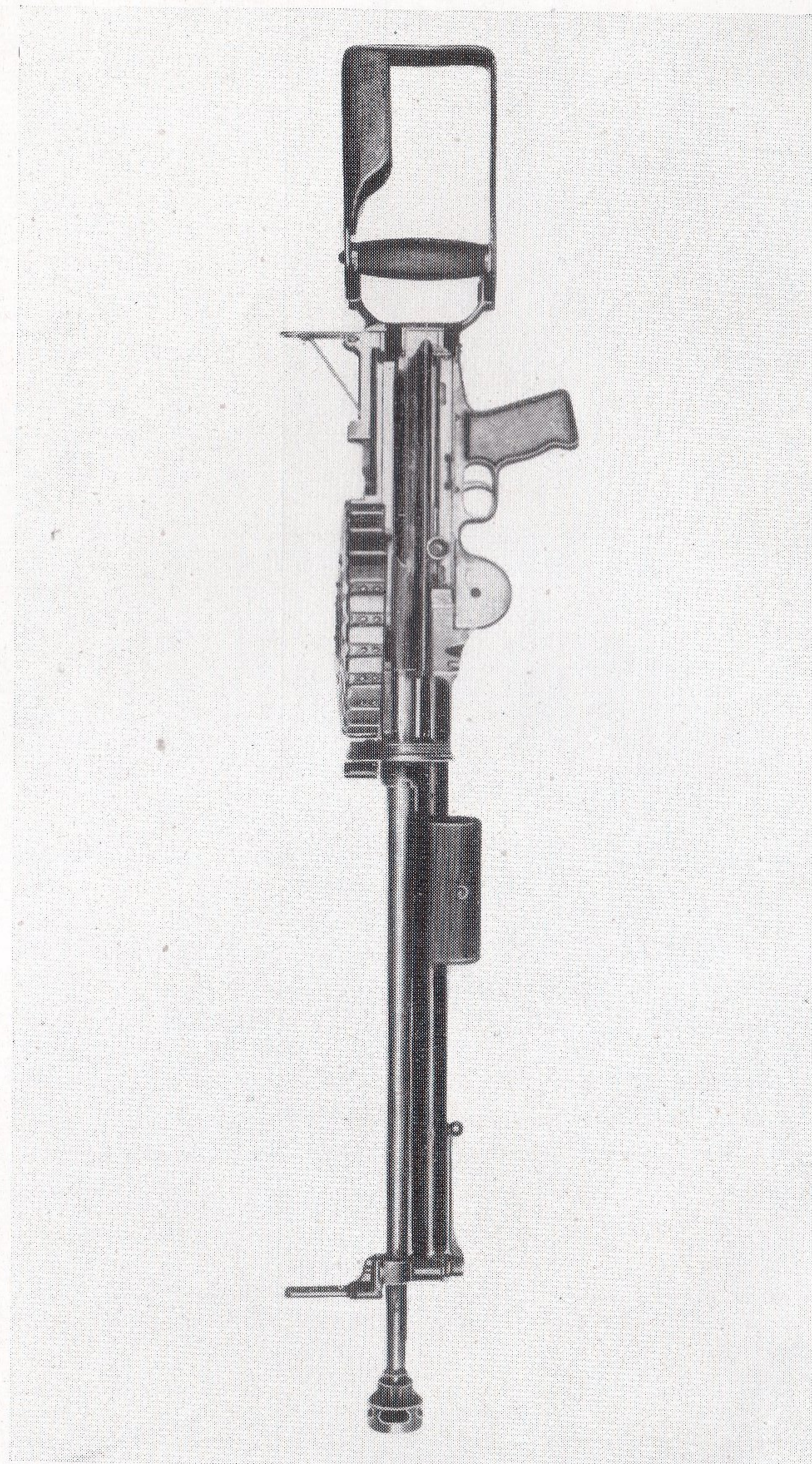


# IMMEDIATE ACTION STOPPAGES

Position of the Cocking Handle.	Action.	Cause.
In the forward position.	<p>(1) Pull back the cocking handle, relay and continue firing.</p> <p>(2) Should the gun not fire, remove magazine and pull back the cocking handle.</p> <p>(a) Should the ejected round be untouched, change the piston rod, relay and continue firing.</p> <p>(b) Should the ejected round be marked by the striker, put on <i>another</i> magazine, reload, relay, and continue to fire.</p> <p>(c) Should no round be ejected, examine the magazine and, if damaged, change it.</p> <p>(3) Should the gun fire single shots only, pull back the cocking handle and remove the magazine. Examine and adjust the gas regulator. Reload, relay and continue to fire.</p>	<p>(1) Misfire.</p> <p>(2)</p> <p>(a) Broken striker.</p> <p>(b) Bad ammunition.</p> <p>(c) Broken, weak or worn feed pawl or spring.</p> <p>No gas.</p>
The cocking handle over the thumb-piece.	<p>(1) Pull back the cocking handle, using loop in pullthrough if necessary. Relay and continue to fire.</p>	<p>(1)</p> <p>(a) Hard extraction.</p> <p>(b) Lack of oil or gas.</p> <p>(c) Dirt.</p> <p>(d) Carbon in gas vent, cylinder, regulator or piston.</p>

	<p>(2) Should the stoppage recur, turn the gas regulator with the large hole to the rear, oil and examine the mechanism.</p>	<p>(2)</p> <p>(a) Return spring too strong.</p> <p>(b) Defective part in the gun.</p>
The cocking handle behind the thumb-piece.	<p>(1) Pull back the cocking handle, relay and continue firing.</p> <p>(2) Should the stoppage recur, pull back the cocking handle, raise the safety catch, remove the magazine, examine the cartridge slot ejection opening and cartridge guide spring.</p> <p>(a) One cartridge half under cartridge guide spring. Change the cartridge guide spring.</p> <p>(b) One cartridge in slot and one in ejection opening. Clear the gun and change the ejector.</p> <p>(c) An empty case in the chamber and a live round in the slot. Clear the gun and change the bolt.</p>	<p>(1) Slight fault in feed.</p> <p>(2)</p> <p>(a) Weak or broken cartridge guide spring.</p> <p>(b) Broken ejector.</p> <p>(c) Broken, worn or weak extractors Dirt may be under them.</p>





THE AMERICAN LEWIS GUN .30

# THE AMERICAN LEWIS GUN ·30

## EXAMINATION OF THE AMERICAN LEWIS GUN .30

1. Pull back the cocking handle and ensure that the breech is clear.
2. Check the number which is on top of the body. This is the gun number as shown in records.

### Barrel Group

3. Examine the recoil reducer and ensure that it will screw on and off correctly.
4. See that the foresight split pin is in position and splayed at the end.
5. See that the foresight is not bent or damaged, and is not assembled back to front.
6. Ensure that the foresight block screw is tight.
7. Make sure that the barrel nut is screwed home tight.
8. See that the gas regulator key is in position.
9. Ensure that the hand-guard screw is tight. (The nut must be in position.)
10. See that the woodwork is not fractured or split.
11. The gas cylinder cover must not be dented.
12. Check the outside of the barrel for damage.

### Body Group

13. Ensure that the mounting yoke clamp key is tight.
14. Check that the mounting pin split pin is in position and correctly splayed out.
15. See that the mounting pin rotates freely.
16. Examine the mounting yoke for distortion and burrs.
17. See that the stop pawls and feed pawl are not broken or incorrectly assembled.
18. Check the cartridge guide for correct tension.
19. Make sure that the magazine key is not burred.
20. Examine the backsight aperture for burrs.
21. See that the upright bar is not distorted.
22. Ensure that the strengthening stay is not distorted.
23. See that the axis split pins (two) are in position and correctly turned over.
24. Make sure that the dust cover is in position and not damaged.



25. Pull back the cocking handle and check the safety device on the dust cover.
26. See that the butt catch spring functions correctly.
27. Look at the cocking handle for distortion.
28. Cock the gun and fire.
29. See that the body locking pin is in position.

#### Trigger Group

30. See that the sear and trigger axis pins are in position.
31. Look at the trigger tail and guard for distortion.
32. See that the grips are not split.

#### Pinion Group

33. Ensure that the pinion screw is assembled correctly.
34. Look at the pinion casing for distortion.

#### Butt Group

35. See that the following screws are tight:
  - (i) Spade grip screw.
  - (ii) The two holding grip screws.
36. Look at the spade grip for fractures or splits.
37. See that the holding grips are not fractured or split.
38. Look at the extension piece for distortion.

#### The Magazine

39. No attempt must be made to strip this magazine.

### TO STRIP

#### Barrel Group

1. Unscrew the recoil reducer. (This is a left-hand thread.)
2. Withdraw the foresight split pin.
3. Remove the foresight.
4. Unscrew the foresight block screw.
5. Drive off the foresight block.
6. Unscrew the mounting ring and remove.
7. Unscrew the barrel nut with the combination tool. (This is at the base of the barrel.)

NOTE.—*The gun must be further stripped before continuation of stripping the barrel group, i.e.:*

- (i) Remove the butt by pressing in the catch and rotating it to the left. (The gun is upside down.)
- (ii) Pull out the trigger group.
- (iii) Disconnect the pinion group and take it off.
- (iv) Pull back the cocking handle to the rear and draw it out.

- (v) Slide out the bolt and piston.
- (vi) Remove the body locking pin.
- (vii) Unscrew the body to the left.

8. Drive the locking piece to the rear and remove it.
9. Using a screwdriver, lever up and remove the gas regulator key.
10. Remove the gas regulator.
11. Slide off the cylinder cover to the rear.
12. Unscrew the hand grip screw.
13. Remove the grip.
14. Unscrew the gas cylinder anti-clockwise.
15. Unscrew the gas chamber, using the combination tool. (It is a left-hand thread.)
16. Slide off the gas chamber housing and bracket.
17. Slide off the barrel nut.

#### Body Group

18. Rotate the feed arm over to the right.
19. Withdraw the body cover to the rear and remove.
20. Push down with the nose of a bullet and remove the cartridge guide.
21. Push in with the nose of a bullet and remove the magazine stop pawl spring.
22. Tap the body cover on the bench and the right and left stop pawls will fall out.
23. Remove the split pin from the backsight axis pin.
24. Take out the backsight axis pin.
25. Slide out the backsight to the rear.
26. Remove the feed arm by rotating the latch.
27. Take off the feed arm pawl and spring.
28. Remove the ejector cover by inserting a bullet in the aperture and lifting up and pulling to the rear.
29. Remove the ejector.
30. Remove the dust covers—right and left—by raising the covers up to the highest position and inserting a screwdriver.

} Backsight Group

#### Trigger Group

31. Drive out the butt catch pin.
32. Remove the butt catch and spring.
33. Drive out the sear axis pin.
34. Remove the sear.



35. Drive out the trigger axis pin.
  36. Remove the trigger.
  37. Remove the trigger plunger and spring.
- Note.*—The grips must not be removed.

#### **Butt Group**

38. Unscrew the spade grip screw.
39. Slip out the spade grip.
40. Separate the cruciform from the extension butt by pulling it out.
41. Unscrew the two rear hand grip screws.
42. Remove the rear hand grip.

#### **The Bolt**

43. Remove the two extractors by levering off with a screwdriver.
44. Unscrew the actuating stud.

#### **The Piston**

45. Drive out the striker fixing pin.
46. Remove the striker.

#### **The Magazine**

47. This must not be attempted.

#### **Pinion Group**

48. Release the tension off the return spring by disconnecting the pinion pawl from the pinion.
49. Remove the pinion screw.
50. Take out the pinion from the casing.
51. Separate the pinion from the pinion casing. This is done by placing the screw in the hub and forcing the casing away from the pinion.
52. Remove the hub.
53. Drive out the pinion pawl axis pin.
54. Remove the pawl and spring.

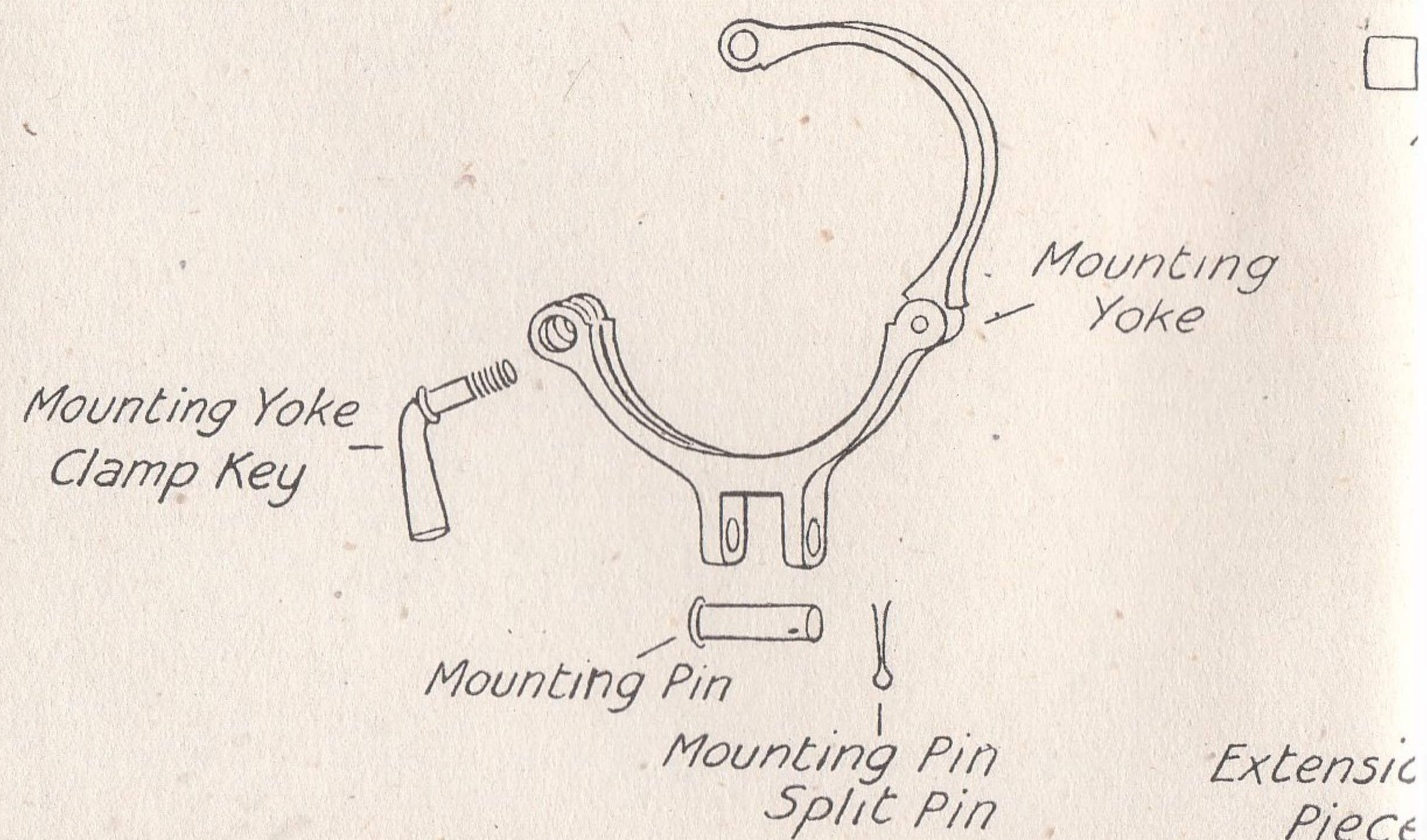
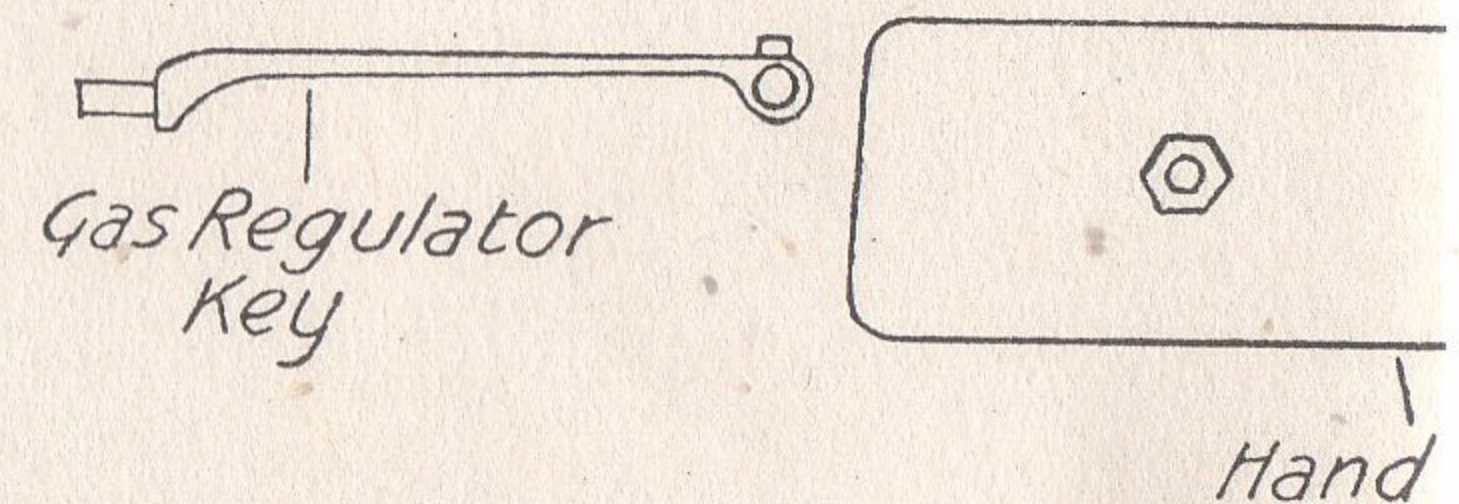
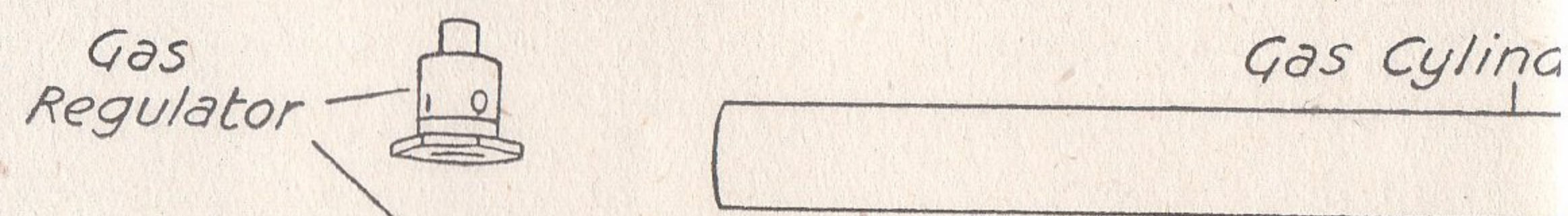
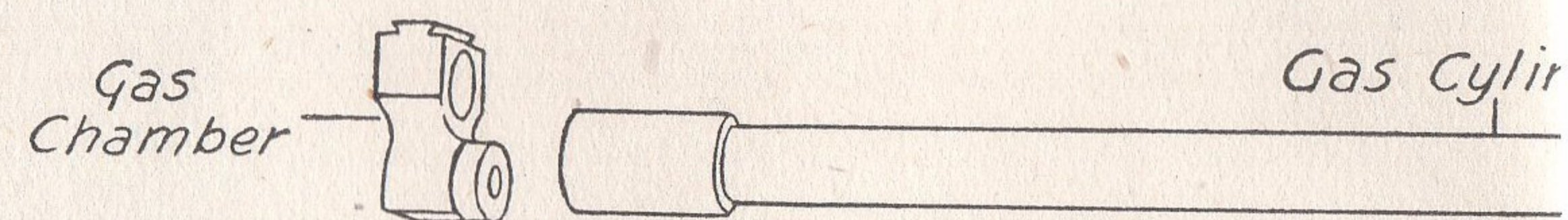
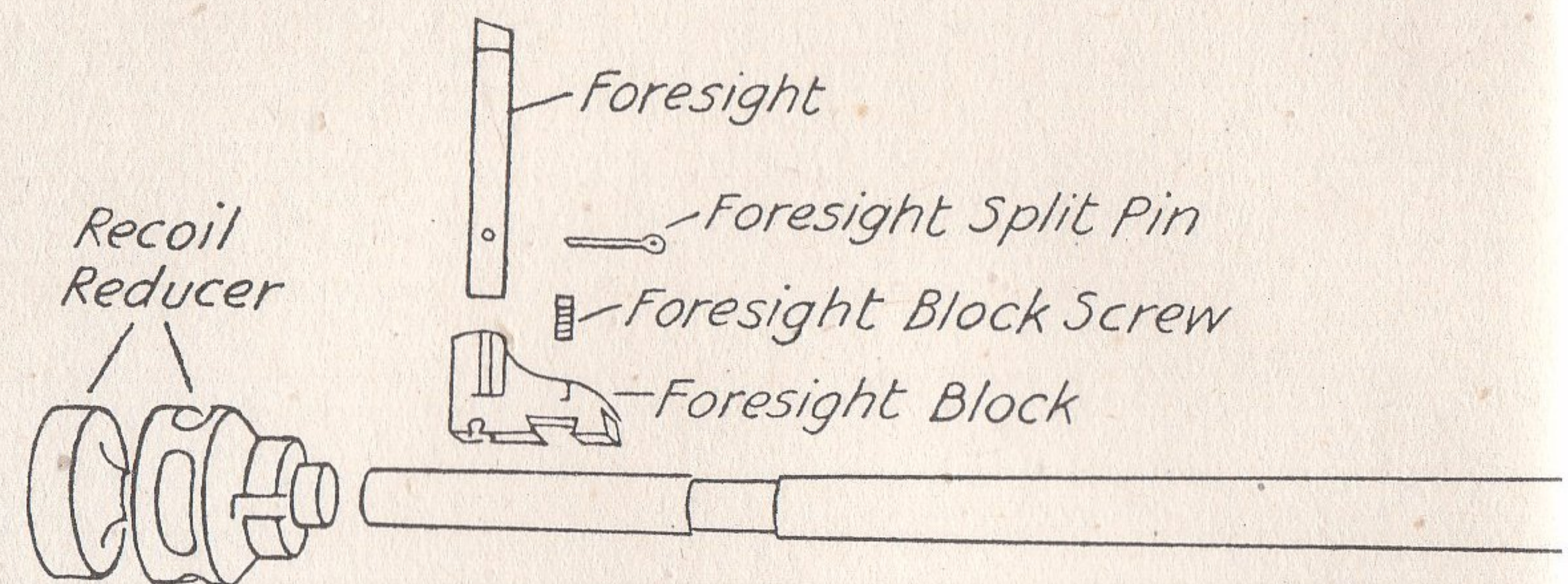
*Note.*—The return spring must not be removed.

### **TESTS AND ADJUSTMENTS**

#### **1. Cartridge Head Space**

The gauges required are 2.007-inch and 2.015-inch. These measurements are taken from the small cone.



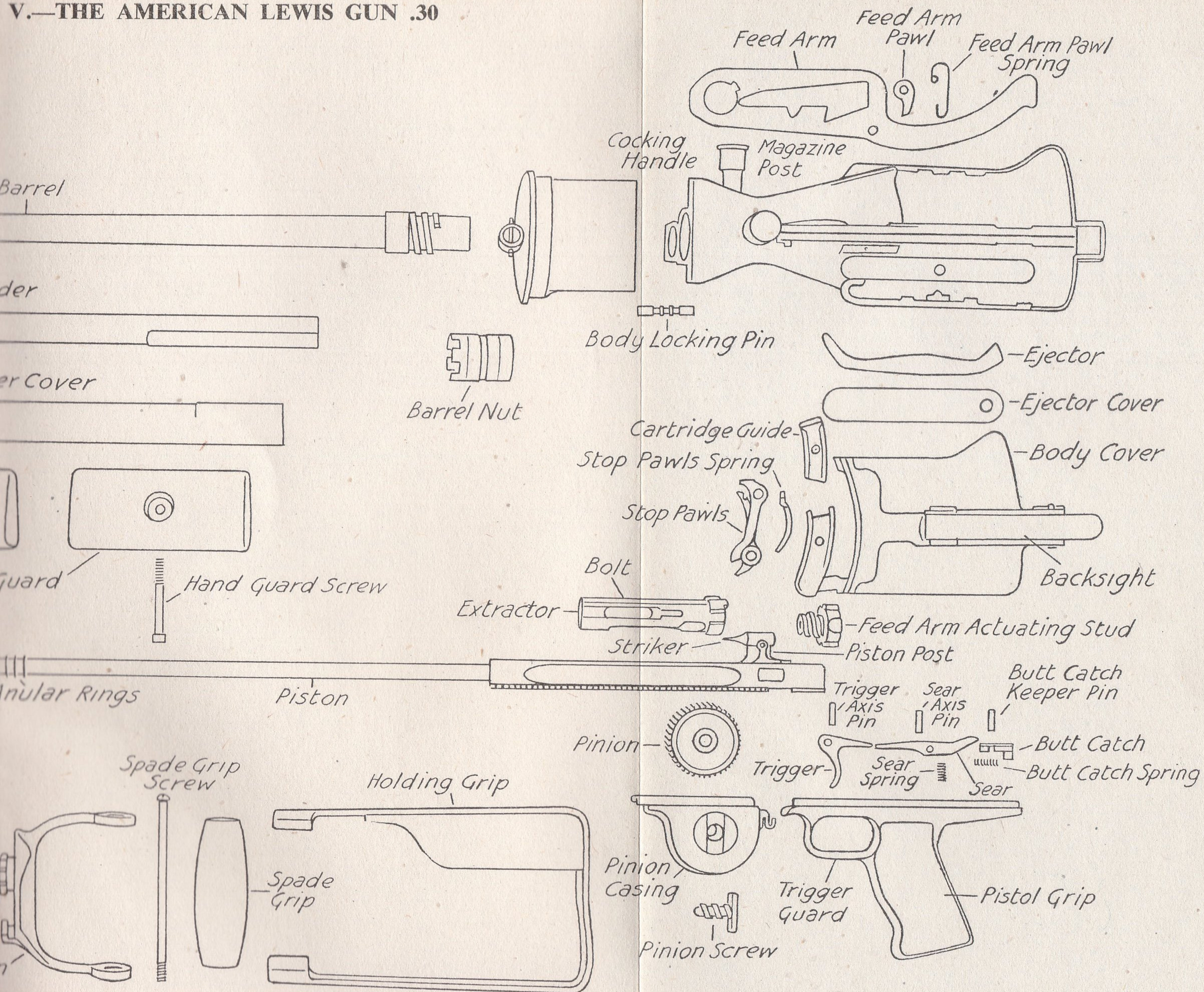


To face page 40

Plate from "The Armourer's Handbook,  
Part III, Light Machine Guns,"  
published by Gale & Polden Ltd., Aldershot



V.—THE AMERICAN LEWIS GUN .30





## **2. Firing Pin Protrusion**

The protrusion is .038 inch low and .046 inch high.  
Assemble the bolt, together with the actuating stud, on the piston rod and gauge the protrusion of the striker.

## **3. Return Spring**

The pull-off should be from 12 to 14 lb.

## **4. Barrel Limits**

- .300-inch: plug must run.
- .302-inch: plug may run.

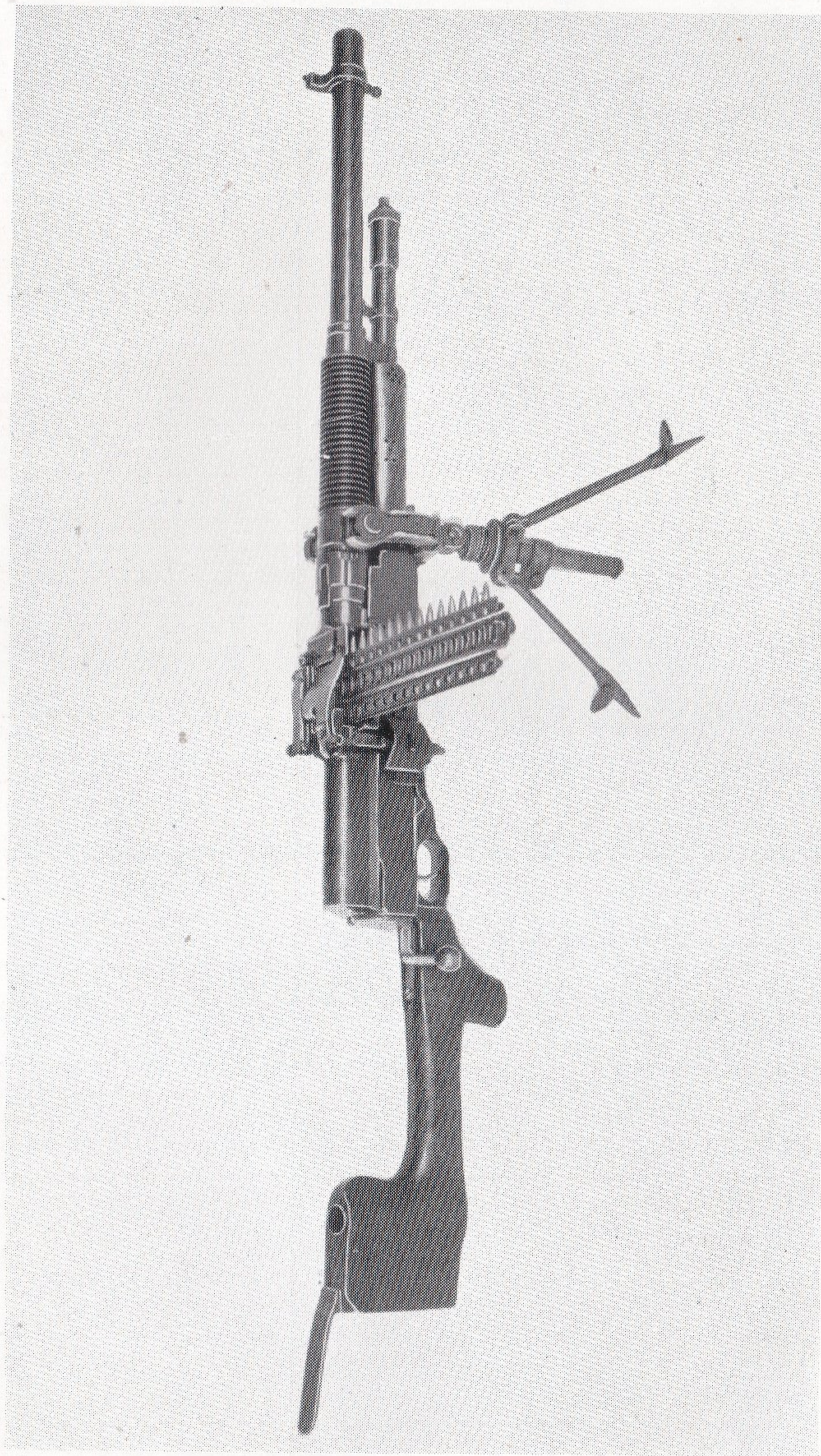


# IMMEDIATE ACTION STOPPAGES

Position of the Cocking Handle.	Action.	Cause.
In the forward position.	<p>(1) Pull back the cocking handle. Relay and continue firing.</p> <p>(2) Should the gun not fire, remove magazine, pull back cocking handle.</p> <p>(a) Should the ejected round be untouched, change the piston rod, relay and continue firing.</p> <p>(b) Should the ejected round be marked by the striker, put on <i>another</i> magazine, reload, relay, and continue to fire.</p> <p>(c) Should no round be ejected, examine the magazine, and, if damaged, change it.</p> <p>(3) Should the gun fire single shots only, pull back the cocking handle and remove the magazine. Examine and adjust the gas regulator. Reload, relay and continue to fire.</p>	<p>(1) Misfire.</p> <p>(2)</p> <p>(a) Broken striker.</p> <p>(b) Bad ammunition.</p> <p>(c) Broken, weak or worn feed pawl or spring.</p> <p>No gas.</p>
The cocking handle over the thumb-piece.	<p>(1) Pull back the cocking handle, using loop in pullthrough if necessary. Relay and continue to fire.</p>	<p>(1)</p> <p>(a) Hard extraction.</p> <p>(b) Lack of oil or gas.</p> <p>(c) Dirt.</p> <p>(d) Carbon in gas vent, cylinder, regulator or piston.</p>

	<p>(2) Should the stoppage recur, turn the gas regulator with the large hole to the rear, oil and examine the mechanism.</p>	<p>(2)</p> <p>(a) Return spring too strong.</p> <p>(b) Defective part in the gun.</p>
The cocking handle behind the thumb-piece.	<p>(1) Pull back the cocking handle, relay and continue firing.</p> <p>(2) Should the stoppage recur, pull back the cocking handle, raise the safety catch, remove the magazine, examine the cartridge slot ejection opening and cartridge guide spring.</p> <p>(a) One cartridge half under cartridge guide spring. Change the cartridge guide spring.</p> <p>(b) One cartridge in slot and one in ejection opening. Clear the gun and change the ejector.</p> <p>(c) An empty case in the chamber and a live round in the slot. Clear the gun and change the bolt.</p>	<p>(1) Slight fault in feed.</p> <p>(2)</p> <p>(a) Weak or broken cartridge guide spring.</p> <p>(b) Broken ejector.</p> <p>(c) Broken, worn or weak extractors. Dirt may be under them.</p>





THE HOTCHKISS MACHINE GUN

# THE HOTCHKISS MACHINE GUN

## EXAMINATION OF THE .303-INCH HOTCHKISS MACHINE GUN

1. Pull back the cocking handle and ensure that the breech is clear.
2. Check the number which is on the left side of the body. This is the gun number as shown in records.

### Barrel Group

3. Examine the foresight band for damage.
4. See that the foresight is correctly assembled.
5. Ensure that the barrel is not damaged.
6. Check the two barrel numbers with the gun number. These numbers are on top of the gas block.
7. See that the barrel trunions are not badly burred.
8. Ensure that the barrel locking nut is secure.
9. See that the gas regulator rotates freely and that the spring keeps it in position.
10. Make certain that the gas cylinder support is not fractured.

### Body Group

11. See that the hand guard is not distorted and is seated correctly in the body.
12. Check the feed spring for correct tension.
13. See that the feed spring stud is present.
14. Examine the backsight leaf spring for correct tension.
15. Ensure that the V, or aperture sight when fitted, is not damaged.
16. Make sure that the axis pin is not damaged.
17. Examine the slide and see that the spring functions correctly.
18. Ensure that the backsight screw is tight.
19. Examine the backsight bed ramps for distortion and burrs.
20. Make sure that the backsight spring screw is tight.
21. Examine the front and rear feed guides for distortion and damage.

Backsight Group.



22. See that the feed-piece cover is not damaged, and test for functioning by opening and closing, using the stud.
23. Examine the lower half of the opening cover for damage.
24. Ensure that the ejector and ejector cap are in position.
25. Test the locking screw for functioning.
26. See that the trigger guard hooks are not damaged.

### **Tripod Group**

27. Examine the yoke forks for distortion.
28. Ensure that the two spring catches function correctly, and the loops are not damaged.
29. Ensure that the catch pins are secure.
30. See that the wing screw functions correctly.
31. The split pin must be in position and properly opened out.
32. The yoke bracket must not be distorted.
33. See that the legs spring functions correctly.
34. Ensure that the retaining nut is secure.
35. See that the spring seating is not damaged.
36. Ensure that the telescopic leg wing screws function correctly.
37. See that the split pin is in position and opened out.
38. Make sure that the telescopic leg is not distorted by moving the leg bracket up and down.
39. See that the split pin at the bottom of the telescopic leg is in position and opened out.
40. The three leg brackets must be checked for distortion, fracture and breakage.
41. See that the legs are straight.
42. Examine the shoes for distortion.
43. Look at the spikes and see that they are not broken or fractured.

*Note.*—The bipod is now obsolete.

### **Trigger Group**

44. Ensure that the sear milled head is not damaged.
45. Test the spring by rotating the sear.
46. See that the trigger guard is not distorted.
47. See that the two trigger guard screws are tight.
48. Examine the cocking handle and see that it is positioned correctly.

49. Examine the tail of the trigger for distortion.

### **Butt Group**

50. Examine the woodwork for splits.
51. Look at the elevating mechanism tube for distortion.
52. See that the shoulder piece bracket screws are tight.
53. Look at the shoulder piece for distortion.
54. Test the shoulder piece spring for functioning.

*Note.*—The elevating mechanism is not now used.

### **Feed Strips**

55. Examine the feed strips for distortion and fracture, and see that the teeth are not broken.

## **TO STRIP**

### **Barrel Group**

1. Remove the barrel by rotating the barrel locking nut clockwise until the left side of the locking spring coincides with the indication line on the body. This is done by striking a sharp blow on the end of the combination tool when it is fixed in position.
2. Strike the front end of the trigger guard against a bench. The barrel will slip out.
3. Unscrew the gas regulator.
4. Drive out the foresight blade.

### **Body Group**

5. Remove the cocking handle by rotating the lever anti-clockwise until the line just to the right of the cocking handle lever coincides with the line on the top half of the trigger guard.
6. Pull the cocking handle to the rear approximately half an inch.
7. Rotate the cocking handle clockwise approximately 30 degrees, and withdraw the cocking handle from the body.
8. Remove the locking screw by unscrewing.
9. Press the butt forward and rotate downwards. The butt and trigger group then comes clear.
10. Withdraw the return spring.
11. Tap the body on the bench, and the piston and breech block will come out.

Cocking  
Handle.



12. Rotate the locking nut anti-clockwise 10 degrees.
13. Remove the hand guard.
14. Unscrew the locking nut.
15. Remove the fermature nut by rotating it until the cam comes in line with the slot in the body. Then withdraw it.
16. Tap the stud on the feed spring forward until the slot in the feed spring coincides with the leg on top of the feed piece.
17. Raise the rear end of the feed spring and withdraw to the rear.
18. Open the feed piece cover plate.
19. Raise the backsight leaf.
20. Raise up the feed piece as far as it will go, and rotate approximately 90 degrees until the flats coincide with the slot in the body.
21. Lift out the feed piece.
22. Drive out the backsight leaf pin.
23. Remove the backsight leaf.
24. Slide off the backsight slide.
25. Separate the slide from the two springs.
26. Unscrew the backsight spring screw.
27. Remove the spring.
28. Unscrew the backsight bed screw.
29. Remove the backsight bed.
30. Unscrew the ejector cap.
31. Remove the ejector and spring.
32. Drive out the feed piece cover pin.
33. Remove the feed piece cover, plunger and spring.

Backsight  
Group

### Tripod Group

34. Remove the split pin from the yoke axis pin.
35. Unscrew the anvil pin.
36. Remove the yoke from the bracket.
37. Drive out the two catch pins.
38. Remove the catches and springs.
39. Remove the split pin from the yoke bracket screw.
40. Unscrew the yoke bracket screw.
41. Take off the bracket from the telescopic leg.
42. Remove the split pin from the bottom of the telescopic leg.
43. Slide off the legs bracket, the spring seating, spring and nut.

44. Remove the split pin from the bracket leg screw.
45. Unscrew the bracket leg screw.
46. Unscrew the bracket leg spring nut.
47. Remove the spring and seating.
48. Drive out the leg tripod pins (three).
49. Remove the legs from the bracket.

*Note.*—All pins on the tripod have been suaged over.

### Trigger Group

50. Raise up the nose of the trigger and pull it forward.
51. Pull the sear to the left approximately  $\frac{1}{4}$  inch.
52. Lift it clear of the trigger guard.
53. Remove the trigger and trigger spring at the same time.
54. Disconnect the trigger spring from the trigger and sear.

### Butt Group

55. Unscrew the rear butt nut screw.
56. Remove the rear butt screw by driving it out.
57. Unscrew the front butt screw and remove it.
58. Remove the butt from the trigger guard.
59. Unscrew the two butt strap bracket screws.
60. Remove the butt strap and bracket.
61. Drive out the butt strap axis pin.
62. Remove the butt strap, spring and plunger.
63. Drive out the elevating gear tube.

### Breech Block

64. Remove the firing pin by shaking it out.
65. Using the hand extractor, compress the extractor spring and withdraw the spring from the breech block.
66. Remove the extractor.

## TESTS AND ADJUSTMENTS

### 1. Cartridge Head Space

The gauges required are .064-inch and .074-inch. The gun must be stripped. The extractor must be removed from the breech block. Replace the barrel and ensure that it is correctly engaged.

The breech block should turn over the .064-inch gauge, but not over the .074-inch gauge. Should it close over the .074-inch gauge then the fermature nut or breech block is at fault.



## 2. Firing Pin Protrusion

The protrusion of the firing pin is .035 inch low and .046 inch high.

## 3. Return Spring

The pull-off is from 12 to 14 lb. When cocked it is from 30 to 40 lb. The spring when fully compressed is 50.7 lb.

*Note.*—The above weights are given as a matter of interest only. The serviceability is governed by the length of the spring.

## 4. Barrel Limits

The serviceability of a barrel is not determined by gauging outside the factory. Three groups of 10 rounds are fired in service bursts. At 200 yards the group must be within a rectangle of 24 inches x 24 inches and the M.P.I. must not be more than 8 inches from the point of aim. At 25 yards the size of the rectangle is 3 inches x 3 inches.

The factory gauging is as follows:

- .303-inch: plug must run.
- .305-inch: plug may run.
- .306-inch: x  $\frac{1}{4}$  inch at muzzle end.
- .309-inch: x 1 inch at breech end.



Plate from "The Armourer's Handbook,  
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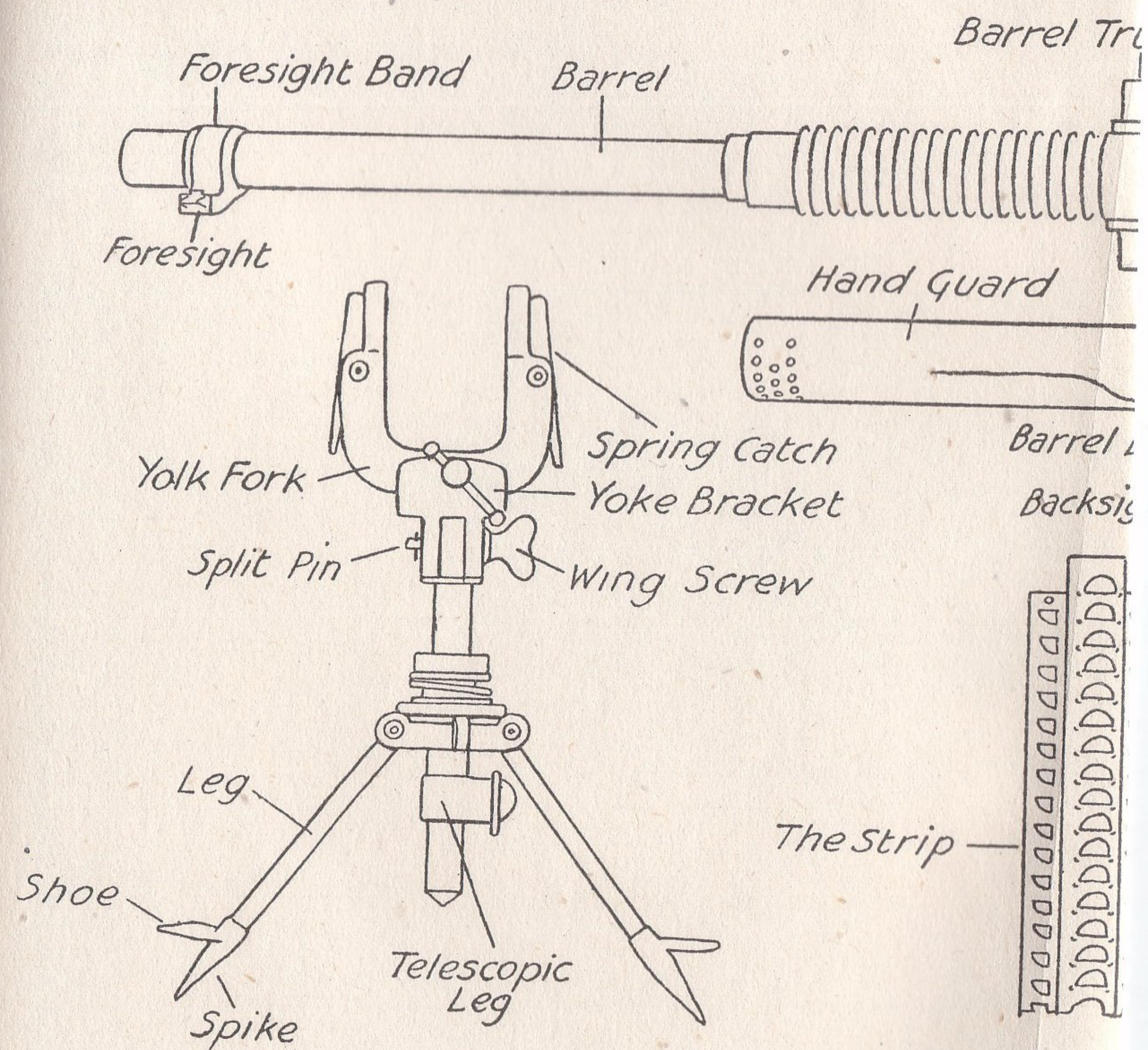
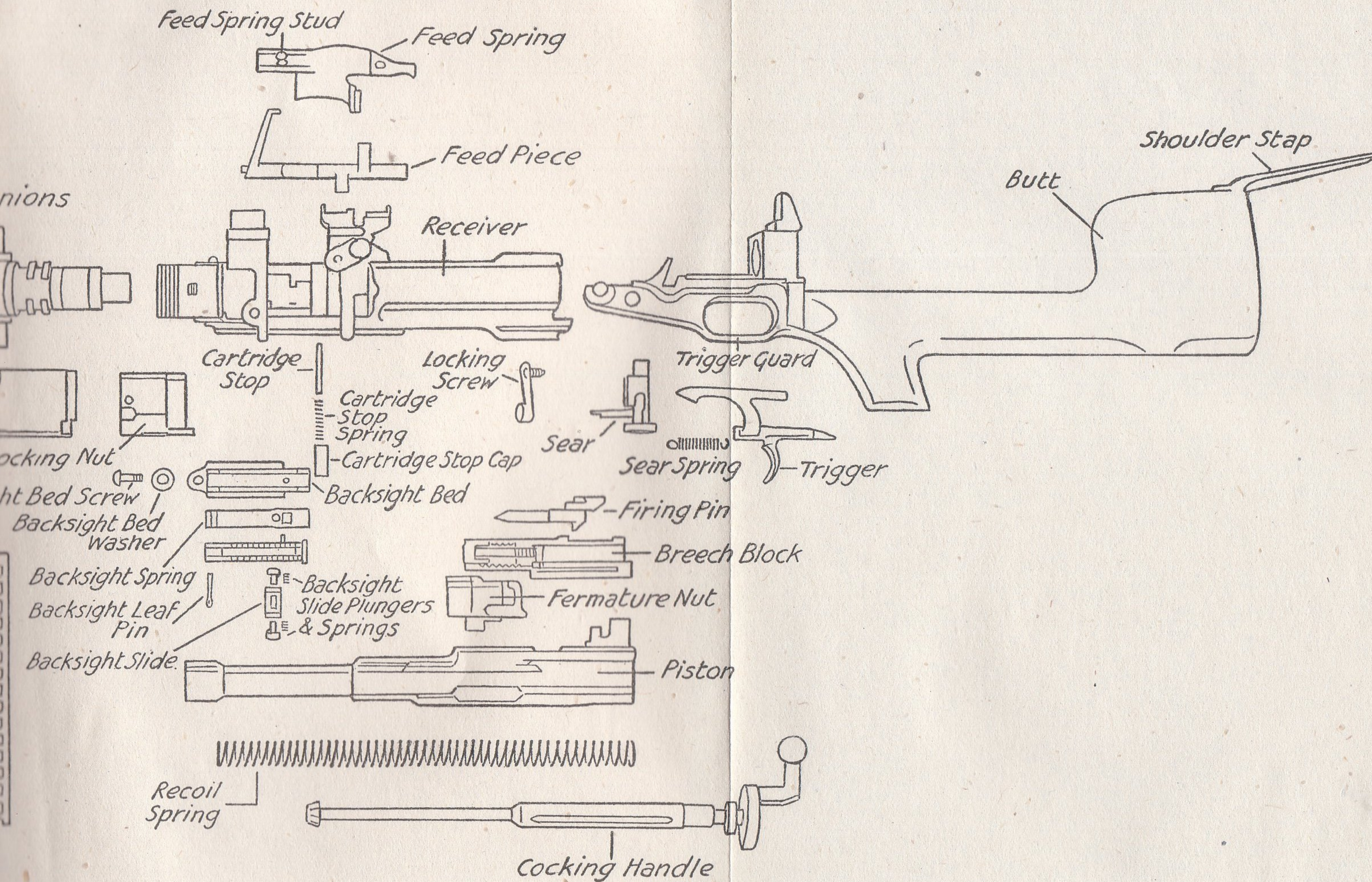




Plate VI.—THE HOTCHKISS MACHINE GUN





Position of the Breech Block.	Cause.	Action.
Any position.	<p>(1) The trigger is squeezed before the strip is fully home.</p> <p>(2) Jamming of the cartridge at the entrance to the chamber on being pushed forward by the breech block. Caused by:</p> <p>(a) Defective crimping.</p> <p>(b) Cartridge not held by clips of the feed strip.</p>	<p>(1) Cock the gun, push the strip fully home, relay and fire.</p> <p>(2) Cock the gun, remove the obstruction, push the strip fully home, relay and fire.</p>
Fully home.	<p>(3) Incomplete feeding forward of the strip due to lack of power.</p> <p>Misfire.</p>	<p>In (b) change the strip and resize.</p> <p>(3) Screw up the gas regulator 5 to 10 divisions.</p>
		<p>(1) Cock the gun, eject the defective cartridge, relay and fire.</p>
		<p>(2) Repeated misfires may be caused by a loose primer falling into the mechanism.</p>
		<p>Dismount the piston and breech block and remove the primer, which will probably be either in the piston cams or in the ferreture nut near the chamber entrance.</p>
		<p>New firing pin.</p>
		<p>Cock the gun. Ensure that the round is ejected. Push the strip home, relay and fire.</p>
Back from chamber.	<p>Broken firing pin.</p>	<p>Unload. See that the barrel is right home. Tighten up the nut, reload and carry on.</p>
Forward and locked.	<p>A bulged or damaged round.</p>	<p>Unload. Clean out after stripping down. Reload and carry on.</p>
Forward but <i>not</i> locked.	<p>When the gun will not fire it is a loose barrel locking nut.</p>	
	<p>When the gun will not fire it is loose filings or caps in the piston cam groove or the ferreture nut.</p>	
Slightly forward.	<p>A round is displaced from the strip and will be hanging down. The strip is defective.</p>	<p>Cock the gun. Remove the round after applying the safety catch. Change the strip. Load and carry on.</p>
Right back.	<p>(1) A live round will be bearing down on an empty case. This is due either to lack of gas or excessive friction.</p> <p>(2) A broken extractor.</p>	<p>Oil and clean the working parts. It may be necessary to screw up the gas regulator 5 divisions.</p> <p>A new extractor.</p>



# COMPARISONS

	Bren, Mark I	Bren, Mark II	Vickers Berthier	Lewis	Hotchkiss	Lewis, .30
Length overall	3 ft. 9.25 in.	3 ft. 10.25 in.	3 ft. 9.5 in.	4 ft. 1.75 in.	3 ft. 10.75 in.	3 ft. 5.8 in.
Length of barrel	2 ft. 1 in.	2 ft. 1 in.	1 ft. 11.9 in.	2 ft. 2.04 in.	2 ft. 11.5 in.	2 ft. 2.06 in.
Length of barrel (without flash eliminator)	1 ft. 10.7 in.	1 ft. 10.7 in.	1 ft. 10 in.	—	—	—
Weight of gun	22 lb. 4 oz.	22 lb. 9.5 oz.	22 lb.	26 lb.	27 lb.	17 lb. 4 oz.
Weight of barrel	6 lb. 3.5 oz.	6 lb. 6.5 oz.	6 lb. 9 oz.	3 lb. 9.5 oz.	10 lb. 14.5 oz.*	—
How operated	Gas	Gas	Gas	Gas	Gas	Gas
Magazine capacity	30 rounds	30 rounds	30 rounds	47 rounds	30 round strip	97 rounds
Weight of magazine or strip (empty)	1 lb. ½ oz.	1 lb. ½ oz.	12 oz.	1 lb. 8 oz.	4½ oz.	2 lb. 14 oz.
Weight of magazine or strip (full)	2 lb. 12 oz.	2 lb. 12 oz.	2 lb. 7 oz.	4 lb. 4 oz.	1 lb. 15 oz.	8 lb. 2 oz.
No. of grooves	6	6	5	4	5	4
Direction of twist	Right hand	Right hand	Left hand	Left hand	Left hand	Left hand

\* With gas block and sight bracket.

## BOOKS RECOMMENDED

**BREN LIGHT MACHINE GUN.** Folder in cover, of handy pocket size. The elementary principles of the operation of the mechanism are clearly shown. The simple procedure of filling the magazine, loading and firing the gun are illustrated by perfect diagrams. Stripping and assembling can be carried out without the assistance of an instructor, by carefully following the instructions on the diagram. Printed in colours ... (By Post, 1/1) **1 0** s. d.

**\*LEWIS GUN MECHANISM MADE EASY.** 7th Edition. By Major C. H. B. Pridham, The Duke of Wellington's Regt. (late Officer Instructor, School of Musketry, Hythe). In handy book form with large folding Coloured Plate, illustrating clearly all parts and action of the Gun; also Photographic Illustrations and Drawings of various working parts. All phases of loading, firing, unloading, and stoppages explained and described in detail. Cleaning notes and table of stoppages. Exceptionally useful for instructional purposes. (Revised to date) (By Post, 1/8) **1 6**

**\*THE COMPLETE LEWIS GUNNER.** A practical sequence of instruction, in simple language and as few technicalities as is compatible with efficiency. By an Instructor. Fully illustrated with Plates and Diagrams (By Post, 2/3) **2 0**

**CONTENTS.**—General Introduction re Evolution of the Lewis Gun: Its Advantages and Disadvantages—Brief Resume of the Gun and Sequence of Instruction—General Description—Stripping and Assembling Mechanism—Stoppages—Elementary Drill and Tests—Care of Cleaning—Points Before, During and After Firing.

\* These books are suitable for use in instruction on American Lewis guns.

**BOYS ANTI-TANK RIFLE, MARK I.** Complete with photographic plates, diagrams and large-scale chart in full colours of all working parts, mechanism, etc. (By Post, 2/2) **2 0**

**CONTENTS.**—Data—General Description—Removing and replacing the Bolt—Placing on and removing Magazine—Mechanism—Magazine Filling and Emptying—Loading and Unloading—Holding, Sight-setting, Aiming and Firing—Firing Position and Sighting—Cleaning—Attachment for Firing with .22 Ammunition—The Improved Range.

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